# Knowledge in Informal African Markets

## A Case study of three informal markets in Zimbabwe

**by**

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## DECLARATION:

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**Date March 2016**

## OPSOMMING

Die tesis prober toon hoe informele markte in Afrika met kennis omgaan.

Die tesis fokus op drie markte in Zimbabwe en ondersoek die kennissisteem wat daarin voorkom.

Uiteraards word geen van die elektroniese hulpmiddels gebruik nie. Wderesydse vertroue en die vermoë om te memoriseer is die basis van die informele kennisstelsel.

Die grootste deel van die tesis is ‘n weergawe van persoonlike onderhoude met deelnamers aan die markte.

# SUMMARY

If knowledge is power, this thesis tries to show how informal African markets share that power. In many African countries such as Zimbabwe, policy makers and development partners are yet to fully understand the knowledge system of the informal markets and how it functions. The informal economy is an informal person to person information system. It becomes a knowledge system when farmers and traders take action based on information signals shared in the market. The information system is informal because the flow of information is not organized formally.

Farmers and traders do not rely on any database or computer for decision-making. The information system that they use connects with the special nature of trust and memory. Given that the informal information system is not regulated or written down, trust becomes the essence of information exchange and of the knowledge system. All relationships in the informal economy are based on trust. This trusted informal information system, on one hand, gives smallholder traditional farmers power around production, use of land as well as livestock ownership and post-harvest handling. On the other hand, by informing farmers about market expectations as well as sorting and aggregating commodities, traders have power to determine the value of farmers' agricultural commodities. Although the information system overlaps with the formal system, person to person information-sharing remains the basic thing reinforcing vertical and horizontal power integration within the market. Without these assets, the informal agricultural market will stop functioning.

In this thesis, Chapter 1 lays out the Structure of the Research, teasing out the main objective of the research which is to understand knowledge dynamics in informal agriculture markets. It also explains the context and essence of the problem under investigation. This chapter also articulates the research questions and provides a contextual description of Zimbabwe's agriculture sector including the role of the informal markets. Chapter 2 captures the scope of work and methodology while Chapter 3 focuses on Knowledge and Learning as theoretical underpinnings of the research.

Chapters 4 and 5 focus on the data collection process where interviews and focus group discussions were the main methods. Chapter 4 captures the voice of the farmers while Chapter 5 dwells on the voice of the traders. As a conclusion, Chapter 6 ties together the key issues around knowledge and learning emerging from this research.

## Acknowledgements

I would like to acknowledge intellectual stimulation and support from my supervisor Professor Johann Kinghorn. The whole team behind the Masters in Information and Knowledge Management (MIKM) at Stellenbosch University deserves special mention for putting together an amazing list of books and other reading materials which laid the ground work for my understanding of the role of knowledge in a rapidly changing world.

People I have interacted with, ranging from farmers, traders and other agriculture value chain actors in farming communities and informal agriculture markets have enriched my thoughts on the deep meaning of life-long learning. This encounter has also confirmed the existence of public literature and situational awareness which is often not mentioned by researchers doing all kinds of work in rural areas.

Last but not least, I would like to thank my wife Barbara and our three children for their emotional support. Barbara was patient enough to wait for me at the dinner table while I completed paragraphs and sentences of whatever I was writing or reading. My mother (*MaSibanda*) inspired me in many ways each time I saw her winnowing sorghum and millet. Her attention to detail illustrated the kind of concentration demanded by the modern world where the amount of information is expanding every day, and increasingly requires a keen eye for detail in order to separate what is useful from what is useless. She remains my model for hard work and meticulous attention to detail.

# Table of Contents

# ACRONYMS AND ABBREVIATIONS

AN Ammonium Nitrate
BP Botswana Pula
BUTA Bulawayo Up-market Traders Association
COP Community of Practice
DDF District Development Fund
GDP Gross Domestic Product
FGDs Focus Group Discussions
ICTs Information and Communication Technologies
KGs Kilogrammes
MIKM Masters in Information and Knowledge Management
NGOs Non – Governmental Organisations
NPK Nitrogen, Phosphorus and Potassium
OPVs Open Pollinated Varieties
US$ United States Dollar
VAT Value Added Tax
ZAR South African Rand
ZESA Zimbabwe Electricity Supply Authority

# *Chapter 1 –*

# Knowledge, Information and Subsistence

## 1.1 Research Scope

The objective of this research is to explore and understand the knowledge dynamics in informal agriculture markets where traditional farmers (smallholders) and traders are the main actors exchanging value and agriculture commodities. Based on evidence from three such informal markets and three communal farming areas in Zimbabwe, the thesis tries to show the extent to which smallholder farmers who interact with traders generate a body of knowledge which both farmers and traders use to cope with their realities. The research also attempts to reveal whether informal agriculture markets have a different knowledge configuration on the use of money as a modern means of exchange.

In addition to examining how traders and farmers deal with conflict and interdependence, the thesis explores the economic and social dynamics of informal agriculture markets. The interface between informal markets and mobile technology is also part of this research. Since there tends to be no formal systems at informal markets, the thesis explores the role of trust and relationships as well as the nexus between trust/knowledge and barter trade. Knowledge pathways as well as the way farmers and traders learn through copying and imitating in the market receive special attention.

Another aspect of the thesis is the extent to which farmers and traders tap into their collective thinking and emergent practices.

The thesis also tries to reveal how the informal nature of information-sharing systems in informal markets helps farmers and traders identify trends, shocks, and competitive behaviours that keep agriculture alive. While informal agriculture markets seem to function in a self-organized manner, there are agents or intermediaries who quietly facilitate relationships between farmers and traders. The thesis will show the role of these intermediaries in agriculture market innovations. Such innovations include changes in formal and informal rules as well as the arrangements that orient the way farmers and traders interact in the market.

Communication is an important part of innovation around informal agriculture markets. It is through communication that the proponents of alternative technical and institutional futures strategically influence others and forge discourse coalitions. Thus, meaningful change is dependent on changes in discourses, representations and storylines that are mobilized by interacting farmers and traders. The thesis tries to show how such communicative devices play a significant role in structuring informal agriculture markets. In any informal agriculture market, farmers and traders are not waiting for science to come and make a difference. Change is already in the making and socio-economic experiments are already taking place even if they are not labelled as such. Farmers and traders conduct their own research which they embed in the on-going processes of change. Diversity in informal agriculture markets is part of the adaptive capacity of farmers and traders.

Finally the thesis raises a few meta-questions. In light of the findings of the research process we have to ask::

1. Are informal agriculture markets unveiling informal learning as an important part of learning?
2. If so, how can formal academic institutions learn from the informal learning which happens in informal agriculture markets?
3. While formal learning as acquisition of knowledge is an integral part of a modern economy, how can it co-exist with informal knowledge?
4. If local and informal knowledge is not enough for farmers to fully benefit from their natural resources, how can the informal market bridge the gap between formal science (quantification) and local informal knowledge (the sociology of how people relate and the institutions they develop, for example, informal regulations)?

## 1.2 The contours of the research

Zimbabwe is an agro-based country where 80% of the population depends on agriculture for a livelihood and the majority of the farmers are women. A total of 70% of the country's population resides in the country's rural areas[1]. In the last 20 years, the economy has largely become informal. Of the 6.3 million members of the population aged 15 years and above who are currently employed, 5.9 million (94.5 per cent) are considered to be in informal employment while 347 000 (5.5 per cent) are in formal employment. In 2011 informal employment was 84 per cent[2].

Since the majority of the population ekes a living from agriculture, many formal and informal economic activities are agriculture-based. The main actors in this agro-based economy are traders working in urban markets and smallholder farmers who have farmed traditionally for generations. Reliable knowledge-sharing practices have developed between smallholder traditional farmers who sell in the market and traders who have occupied informal markets for years. This relationship has been deepened by the fact that urban food markets now influence what farmers produce and sell.

While big commercial farmers have traditionally sold their commodities to institutional buyers like private companies which they also controlled, the majority of smallholder farmers have sold and continue to sell their commodities in informal open markets. Only a few smallholder farmers are able to meet the stringent requirements of institutional buyers. On the other hand, traders who have tried to sell commodities to formal institutions like hotels and food chain stores have faced numerous barriers. These are some of the factors that enabled the growth and power of informal markets where traders and farmers set their own rules of engagement while consumers get what they want irrespective of social status and income levels.

Relationships between smallholder farmers and traders have become so strong that many farmers can leave their commodities at traders' stalls and only come to collect income from the sales after a number of days, especially if the market is slow. Many traders now move between farming communities and consumption zones like urban areas meeting the food and economic needs of farmers, processors, consumers and many other value chain actors.

[1] Horticulture Sub-Sector Study report, September 2014 (page 7) SNV Netherlands

[2] Zimstat's 2014 Labour Force Survey (March 2015).

Choices in the formal economy are narrowing with thousands of university graduates trained for the formal economy stranded except those who see opportunities in the informal economy. The majority of people migrating to urban areas are not being attracted by manufacturing but service industries, the informal economy, churches and many other non-formal activities. Satisfaction of the food requirements of the majority of the urban population falls upon the shoulders of informal traders and their relationship with farmers. Conversely, financial institutions in Zimbabwe are yet to respond to the requirements of the ballooning informal sector that has become a landmark feature for all African countries.

## 1.3 Defining the informal economy

Informal agriculture markets are a bigger part of many African countries' informal economy. The Informal Economy is simply that part of the economy the government would love to tax but cannot find ways to do so. Africa's informal economy was originally thought of by many as a temporary stage in the development process. It was believed that as developing countries went through industrial development, the informal sector would gradually fade away. It was assumed that the unlimited supply of labour in developing countries would eventually be absorbed into the formal economy as the industrial sector expanded.

According to Kristina Flodman Becker[3], "since the 'discovery' of the informal economy in the beginning of the seventies, many observers subscribed to the notion that the informal economy was marginal and peripheral and not linked to the formal sector or to modern capitalist development. Some continued to believe that the informal economy in developing countries would disappear once these countries achieved sufficient levels of economic growth and modern industrial development".

However, as this thesis shows, the informal economy can no longer be considered a temporary phenomenon in countries like Zimbabwe. The informal economy has been observed to have more of a fixed character in countries where incomes and assets are not equitably distributed. It seems that if economic growth is not accompanied by improvements in employment levels and income distribution, the informal economy does not shrink. That is probably why the informal economy is continuously increasing in most developing countries, including in rural areas. Estimates show that the non-agricultural employment share of the informal workforce is 78% in Africa, 57% in Latin America and the Caribbean, and 45–85%

[3] Swedish International Development Agency (Sida) 's Fact Finding Study by Kristina Flodman Becker (March 2004, p.3)

in Asia. In all developing countries, self-employment comprises a greater share of informal employment than wage employment.

Some researchers refer to the *informal sector* as the *informal economy* to get away from the idea that informality is confined to a specific sector of economic activity but rather cuts across many sectors. The term "Informal economy" also emphasises the existence of a continuum from the informal to the formal ends of the economy and thus the interdependence between the two sides[5]. The weak capability of formal institutions to provide education, training and infrastructure as well as other incentives for structural reforms has contributed to the growth of the informal economy. Many governments are unaware of the economic contributions of the informal economy and the problems found in it and have, therefore, found it unnecessary to intervene because of the belief that the informal economy would die out.

There are three main schools of thought regarding the relationship between formal and informal economies[6]:

– *The dualists*: the informal economy is a separate marginal economy not directly linked to the formal economy, providing income or a safety net for the poor[7].

– *The structuralists*: the informal economy is subordinated to the formal economy. In order to reduce costs, privileged capitalists seek to subordinate petty producers and traders[8].

– *The legalists*: informal work arrangements are a rational response by micro-entrepreneurs to over-regulation by government bureaucracies[9].

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[5] Swedish International Development Agency (Sida) 's Fact Finding Study by Kristina Flodman Becker (March 2004, p.8)

[6] Chen M et al, 2002. Supporting Workers in the Informal Economy: a Policy Framework

[7] ILO. 1972. Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya, pp. 223-232. Geneva, Switzerland: International Labour Office.

[8] Castells, M., & Portes, A. 1989. World underneath: The origins, dynamics, and effects of the informal economy. In A. Portes, M. Castells, & L.A. Benton (Eds.), The informal economy: Studies in advanced and less developed countries (pp. 11–37). Baltimore: Johns Hopkins University Press.

[9] de Soto, H. 2000. The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else. New York: Basic Books.

In very general terms, the informal economy is the unregulated non-formal portion of the market economy that produces goods and services for sale or for other forms of remuneration. The term "informal economy" thus refers to all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements.

Traditionally, the informal economy was perceived as comprising mainly survivalist activities. Various negative aspects were used to describe the informal economy ranging from undeclared labour, tax evasion, unregulated enterprises, illegal and criminal activity. Nevertheless, the vast majority of informal economy activities provide goods and services whose production and distribution are perfectly legal. In addition, informal economy activities are not necessarily performed with the deliberate intention of evading payment of taxes or social security contributions, or infringing labour legislation or other regulations.

Informal enterprises are characterised as informal because they rarely comply with all the regulations that apply to their trade, for example concerning registration, conditions of employment and operating licenses. Informal enterprises are not only units that employ hired labour but also those that are owned and operated by single individuals working as self-employed. Accordingly, independent street vendors, taxi drivers and home-based workers are all considered to be enterprises. Since these enterprises have limited capital resources, they rarely engage in transactions, enter into contracts or incur liabilities. The owners generally have to raise the necessary finance at their own risk. Informal enterprises also rarely have any accounting system in place.[10].

As the informal economy is quite heterogeneous in terms of capital invested, technology in use, adopted management practices, productivity levels and net earnings, its players also constitute a heterogeneous group with different reasons for joining the informal economy. At one end of the spectrum of the informal economy are small-scale modern manufacturing and service enterprises. At the other end are street vendors, shoe shiners, junk collectors and domestic servants. In between are a whole range of primary service activities such as informal transport services, small trading and commercial establishments.

Estimating the size of the informal economy is problematic, although there are internationally defined measurement methods to define the size and contribution of the informal economy to

[10] Swedish International Development Agency (Sida) 's Fact Finding Study by Kristina Flodman Becker (March 2004, p.11)

national accounts. In addition, data on the informal sector (excluding agriculture) are often missing compared to data on the total workforce (including agriculture), resulting in an under-estimation of the significance of the informal sector. The informal economy is, therefore, not necessarily adequately reflected in the national accounts. Consequently, the use of, for instance, the Gross Domestic Product (GDP), as a way of measuring economic development, does not always reflect the actual situation in a country.[11]

Some researchers refer to the informal economy as the 'shadow economy'. "Shadow economy" and "informal economy" are only two of the terms used to denote a real socio-economic phenomenon the dimensions of which can be observed in various forms and to a varying degree in the economy of each country.[12] One of the most common definitions of the term reads as follows: "*market-based production of goods and services, whether illegal or legal that escapes detection in the official estimates of the GDP*".

"Informal business can be defined as that one in which the common traits are low levels of technology, few capital requirements, simple division of labour and little differentiation of ownership of means of production. But in many cases there are businesses that are partially informal and partially formal. These businesses comply with some of the regulations but not with others".[13]

### a) The Informal information and knowledge system

This thesis reveals that the character and resilience of Africa's informal economy can be explained through its unique information and knowledge system. The informal-ness of the information system makes it an informal economy. In fact, it is a structure underpinned by human beings not machines. This has an impact on how actors in the informal economy such as farmers and traders view knowledge. This information system connects with the special nature of trust. Since the informal information system is not regulated or written down, trust becomes the essence of information exchange and knowledge system. Trust is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trust or,

[11] Charmes J., Estimation Survey methods for the Informal Sector, 2002

[12] Kumanova A., Manolov V., The Concept of Shadow Economy – Main Approaches to Its Statistical Estimation, Statistika

Journal, No. 2 of 1996 (in Bulgarian)

[13] Informal Economy Trouble or Opportunity?. Working paper hosted by The Berkeley Electronic Press (2006, p.4)

irrespective of the ability to monitor or control that other party[14]. Farmers and traders trust each other and trust the information they share. On the surface it does not look like an information system but it is a person-based and very effective information system. Trusted sources of information and relationships support learning as the capacity of farmers and traders to use their memory. Their memory enables them to remember information as what is useful in solving problems today and tomorrow not just as data.

As in other African countries, the notion of informality in Zimbabwe is much closer to the real world than the formal order. The formal order is not known by the majority and, therefore, not complied with. In other parts of the world the formal order has seemed like an imposition of the elites and does not relate to the customary order. As a result of that many activities are conducted informally, not as a consequence of high costs, but because the order under which those activities are conducted has not been recognized by the formal system of law[15].

### b) Zimbabwe's informal agriculture markets

Zimbabwe has more than 20 informal agriculture markets where farmers, traders and consumers exchange agriculture commodities, money, do barter deals and share knowledge. The biggest market is Mbare[16] in Harare where agriculture commodities flow from many production areas around the country mainly all Mashonaland Provinces, Manicaland and Midlands Provinces. All these informal agriculture markets are sources of knowledge for the majority of the actors who do not rely on formal ways of sharing knowledge. Agricultural commodities from neighbouring countries like South Africa, Malawi, Mozambique and Zambia also find their way into Mbare market. Mbare Market in Harare has more than 5000 traders who handle commodities from more than 900 000 smallholder farmers annually. These commodities end up in the hands of more than 4.2 million consumers in the Greater Harare area. At least 1000 smallholder farmers bring commodities to Mbare Agriculture market daily from diverse provinces. The farmers surrounding all these urban markets also supply commodities to local markets. Some of the horticultural commodities from Mbare end up in fishing villages around Kariba with some going as far as Siavonga in Zambia via boats.

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[14] Mayer, R. C., J. H. Davis, et al. 1995. "An integrative Model of organizational trust." Academy of Management Review.

[15] Informal Economy Trouble or Opportunity?. Working paper hosted by The Berkeley Electronic Press (2006, p.5).

[16] Horticulture Sub-Sector Study report, September 2014 produced by an NGO, SNV Netherlands.

Other informal markets are in Mutare, Bulawayo, Gweru, Masvingo, Kwekwe as well as in small towns and rural business centres. Contrary to formal markets like supermarkets, these markets are always open even during holidays. While commodities go in and out of the markets according to seasons, there is never a time commodities will not be available. Commodities like onions, carrots, apples, oranges and groundnuts from South Africa and other countries are brought by local traders according to demand and supply trends. This is also how seed and other planting materials from other countries end up being grown by farmers in Zimbabwe's rural areas. For example, a uniquely Zambian bambara nut is now being grown by smallholder farmers in Mwenezi district of Masvingo. These farmers could not access this seed if there was no informal market based on a vibrant informal information system. Using their own person to person information systems, farmers and traders play a critical role in the movement of commodities, planting materials and associated production and post-harvest handling knowledge.

In almost every informal agriculture market, the dominant commodities are horticulture – leafy vegetables, tomatoes, carrots and a wide range of fruits (bananas, apples, mangoes, peaches, naartjies, pine apples and many more. Currently, 70 per cent of produce grown by smallholder traditional farmers in Zimbabwe is distributed and sold through informal marketing channels[17]. Some of the produce is sold by roadside traders and through informal but organized markets in major population centres like Harare, Bulawayo and Mutare.

[17] Zimstat's 2014 Labour Force Survey (March 2015).

**Mbare (Harare) informal agriculture market in the morning**

All urban informal agriculture markets in Zimbabwe open at around 5am daily, closing at 12 noon. Local authorities such as Harare City Council, Mutare City Council, Bulawayo City Council, Masvingo City Council, Gweru City Council as well as local councils such as Gokwe South Rural District Council own the markets because they provide space for trading. Farmers pay US$5 - US$10 for selling their commodities in these markets. Traders who have permanent stalls pay at least $40 per month to local authorities. The market infrastructure comprises basic sheds and bays. In the farmers' market, every commodity is sold out daily with some ending up in the wholesale market where it can take up to three days depending on demand. There is generally no electricity supply in the market, although water is available.

Every rural district in Zimbabwe has a rich mosaic of locally rooted practices and initiatives that promote and enhance agricultural biodiversity. This biodiversity is more visible on the informal market than on farms where it is difficult to develop a complete picture cost-effectively. Through the informal market, farmers and traders hold precious knowledge. Farmers believe the future of agro-biodiversity in Zimbabwe rests on deep transformation in

agricultural policy, practice and knowledge-sharing. Such a transformation cannot happen without deep knowledge of how the informal market functions.

Since many institutions including the government have not been adequately prepared for the growth of the informal sector, not much is known about how the informal sector works and continues to grow. Knowledge-generation, sharing patterns and activities that sustain the agriculture-based informal economy are barely understood from an empirical point of view. As a result, the true contribution of the informal agriculture market to the national economy remains unknown although the formal sector is offloading many people onto the informal sector through the loss of formal jobs.

## 1.4 Why traditional smallholder farmers?

The thesis focuses on traditional smallholder farmers who have held on to some of their age-old farming practices against an onslaught from modern industrial agriculture. The majority of smallholder farmers who bring commodities to the informal markets still use traditional ways of producing and selling commodities. On the other hand, traders with whom traditional farmers interface, have been exposed to modern commerce and deal making skills that are part of modern knowledge shared at the market. A significant proportion of commodities that flow into informal agriculture markets are produced in wetlands through traditional practices that prevent water logging and complete destruction of the wetlands.

Moisture that rises to the surface around August enables smallholder farmers in areas like Mutoko, Makoni, Mhondoro and Gutu to produce commodities that come to the market in November and December when farmers who depend on rain-fed agriculture are still preparing to grow their summer crops. Tomatoes, potatoes, maize, wheat and rice grown in wetlands fetch high prices on the market during particular periods of the year. Farmers are aware that this traditional farming system is sensitive to the environment. The research tries to show the extent to which traditional farmers' sensitivities to the environment in producing crops influences the informal trade of agriculture commodities.

The majority of smallholder traditional farmers continue to practise inter-cropping where more than one crop is planted in one field. Some of the advantages of inter-cropping include: maintaining soil moisture and reducing soil erosion caused by run-off water. Intercropping has also been found to have advantages in weed control. In Zimbabwe, it is used as a method of weed control as well as to maximise land use. Traditional farmers also have effective ways of weed and pest control. One of the methods used by traditional farmers in weed

control is selective weeding where certain weeds are left on the land as a form of moisture control.

Most smallholder traditional farmers live on marginal land where the impact of climate change and selection pressures is greatest. As a result they have become local experts in identifying crop species and varieties resilient to shocks and stresses. Such knowledge is shared through the market more than through conventional extension approaches. Women and older farmers are active breeders of plants and livestock, conserving local landraces and traditional breeds, drawing on wild species and selecting their preferred and adaptive characteristics over generations. Most of these breeds find their way to informal agriculture markets. The farmers have deep knowledge and understanding of local conditions, including experience of historical events that have shaped the current system. Besides out-numbering scientists, their potential contribution to agriculture is enormous.

Through the informal market, smallholder farmers have a big opportunity to speak with people who eat what they produce (consumers). They can then go back home and improve. This is contrary to formal contractual arrangements where farmers produce for a private company which sells to food chain stores where agriculture commodities are displayed under the name of the food chain store. The identity of the farmer who produced is completely erased. Consumers speak to food chain store employees but much of the feedback does not get to farmers in its raw state. Since they get rich feedback from diverse consumers, the majority of smallholder farmers prefer the informal market. Feedback is probably one of the reasons why informal markets continue to survive and attract masses even when there is no advertising.

In the informal market you get produce by area. Some smallholder farmers are passionate about keeping the identity of the producer and area of origin, for the purposes of maintaining some kind of branding. Branding is useful for incentivising producers and areas that are doing well. By contrast, when the product is on the shelf in food chain stores, it doesn't show a farmer's ingenuity. For instance, exporting companies do not recognise source or producer when they put products on the market. By rendering producers anonymous, contracting companies prevent international consumers from getting directly in touch with the producers.

## 1.5 Why traders in the informal market?

Informal traders play a significant role in the informal agriculture market. There are various types of traders. One group has permanent stalls in the wholesale market from where they

take the commodities they buy from the farmers market for re-sale to consumers. This group of traders nurtures strong relationships with farmers most of whom become comfortable enough to leave their commodities for slow-selling particularly when demand is low and erratic. The second group of traders goes to farming areas where they buy commodities like tomatoes and potatoes directly from the field and bring them to the market. This group is usually the source of significant information on which farmer will be harvesting tomatoes and potatoes at a given time. Some of this information is not given to competitors who may end up snatching the commodities away from some traders.

The third group of traders found in all the markets in Harare, Mutare and Bulawayo are referred to as *makoronyera* in the Shona language. The term means tricksters because these *makoronyera* are often accused of taking advantage of farmers by negotiating for low prices and then sell the same produce at higher prices. Although this group is considered bad in the informal market, they have an important role particularly where it is difficult for farmers to know everything going on in the entire agriculture value chain. In most cases the *makoronyera* alert farmers to market dynamics such as the volume and variety of commodities in circulation. Just like farmers, all the above classes of traders operate on tacit rules that are not codified knowledge which someone can see in the form of a document. They have existed in the informal agriculture market for a long time and continue to be part of the agriculture value chain. However, not much is known about their knowledge dynamics and how and why they continue thriving.

Traders and smallholder farmers are the main participants in the flow of information, ideas, agriculture commodities and services in the informal agriculture market. However, the knowledge pathways that link the informal and formal agriculture markets have not been explored. This research tries to expose what happens to knowledge when traders and traditional smallholder farmers meet in informal agriculture markets. The research also tries to reveal whether traders and farmers have particular ways of conceptualizing, understanding and communicating. This is important given the extent to which markets are considered expressions of development through modernization.

Hopefully, the thesis will contribute answers to the agriculture sector on which many developing countries are anchored. One of the challenges facing Zimbabwean agriculture and rural development is the lack of reliable, usable and timely information and knowledge for effective decision-making. A significant part of the available information is either out-dated or dispersed in various institutions and environments as well as among people. When projects

and programmes by various Non-Governmental Organisations (NGOs) and other development organisations come to an end, in most instances there is no clear mechanism for the information or knowledge that was gathered to inform the next interventions. In addition, competition rather than collaboration among organisations working in the same sector prevents knowledge-sharing with some organisations preferring to reinvent the wheel than build on what another organisation has generated. Some of this negative competition is caused by funding patterns because many donors and funding agencies are not flexible enough to collaborate through activities in the same district or region.

Insights from this research will inform ways of integrating agriculture information and content currently scattered in organizations such as NGOs, parastatals, farmer organizations, government departments, commodity buyers, transporters, financial institutions and individual farmers who work through the informal agriculture market. Given the overlaps between formal and informal markets, there is probably much value in bringing all this information together and creatively interpreting it for various users.

The informal sector seems to provide an environment where farmers and traders can express their hunger for meaningful connections with one another and other value chain actors. Farmers and traders want to understand if the stereotypes about agriculture are true. They want to connect and decide for themselves.

## 1.6 Research Style and questions

The research project of which this thesis is the report is best understood as an attempt to execute a grassroots investigation. As such it can be categorised academically as sociology of knowledge.

Owing to the subsistence nature of the people's agricultural activities and the processes involved it could only have been done in the mode of storytelling – the story of vegetables and the people who produce and buy them – set against the background of all the realities that the actors in the story deal with every day. In and through these accounts shines the light of the operative knowledge.

Being an informal economy, there is naturally very little formal documentation and even less formal systems, but that does not mean that information and knowledge are absent (or of a lesser quality). It does mean, however, that formal means of data-elicitation – as is the usual practice in research projects – is not only ineffective, but also inappropriate. To understand a

little of the information and knowledge activities in a subsistence environment we have to tune into the objects that hold value for the actors and see how they cultivate and trade them.

Accordingly, this research focuses on potatoes and tomatoes which are now commonly grown by traditional farmers and sold to traders and other consumers at informal agriculture markets in Zimbabwe. Both potatoes and tomatoes are frequently produced and they are increasingly becoming basic food for many households. Instead of focusing on all the agriculture commodities that circulate in informal agriculture markets daily, the research focuses on potatoes and tomatoes for comparability.

The specific questions that were posed to the respondents are listed at the end of chapter 2. Here it is appropriate only to indicate the overall intentions of the actual questions:

1 In what way does the interaction with traders in the informal market change the way in which traditional smallholder farmers produce (tomatoes and potatoes?)

2 In what way do traders react to the products that farmers bring to the market?

3 Are any of these, changes of knowledge or merely short term adaptations of expedience? Do farmers and traders learn from the interface or do they merely adjust because it is the fashion of the week?

## 1.7 Research assumptions

To the extent that both traditional smallholder farmers and traders bring their knowledge as individuals, as members of particular communities and as specialists in their respective areas of work to the informal market, the research anticipated a mix-and-match knowledge activity between farmers and traders. The notion of a mix and match knowledge activity means that farmers and traders combine information from their farming practices with exchanges that happen in the informal market as well as making lessons from both sides mutually compatible.

Mixing and matching further means the fusion of farmers' traditional ways of farming and exchanging crops with modern ways of trading which are a characteristic feature of traders. Institutions like informal agriculture markets and people interacting in these markets rely on their local knowledge to contextualize and make use of the general (external) knowledge they may access.

In spite of the prestige and importance of scientific knowledge, its use in any activity, such as value generation and innovative initiatives cannot happen without the complement of local

knowledge. Some authors refer to local knowledge as "a body of very important but unorganized knowledge which cannot possibly be called scientific in the sense of knowledge of general rules: the knowledge of the particular circumstances of time and place"[18]. However, despite its practical relevance, local knowledge is not enough to capture the systemic nature of the problems that farmers and traders face in informal agriculture markets. To lead innovative initiatives and develop sustainable solutions, farmers and traders have to combine (mix and match) local and general (external) knowledge.

The quality of external knowledge may affect the effectiveness of innovative initiatives in the informal agriculture market. Traditional smallholder farmers require aspects of external knowledge to make decisions that react to the market while traders also need local knowledge to be able to survive. To that extent the market provides an environment where farmers and traders mix-and-match knowledge while existing in the same knowledge ecosystem. The systemic nature of local problems can only be fully captured through interpretations that make use of general (external) knowledge. In line with this perspective, for both farmers and traders, things may make sense through comparisons with external ideas from traders and consumers who also visit the informal market.

Estimating the growth and amount of useful knowledge in traditional agriculture and informal agriculture trade is a difficult task. Quantifying the stock of all types of useful knowledge held by entire agriculture informal markets, farmers and traders (propositional and prescriptive, explicit and tacit, private and public, general and local) is a very demanding undertaking. In this research, traditional smallholder farmers and informal traders as well as the informal agriculture market are used as proxies in trying to understand whether the capacity of farmers and traders increases due to their interface in the informal market.

## 1.8 Significance of the research

The findings of this thesis contribute to academic and practical knowledge in a number of ways.

[18] Hayek,1945 p. III-H9; 519 – 30.The Use of Knowledge in Society. *American Economic Review 35*(4). According to Hayek, "The 'man on the spot' cannot decide solely on the basis of his limited but intimate knowledge of the facts of his immediate surroundings or local knowledge. There still remains the problem of communicating to him such further information as he needs to fit his decisions into the whole pattern of changes of the larger economic system".

Firstly it presents data about informal markets that does not exist at the moment. Most of the research on agriculture focuses on production and general economic activities. But in this thesis the focus is on market activities as expressions of knowledge and information.

Secondly the thesis presents perspective that should enable policy makers, the private sector, financial institutions, input providers and other stakeholders to better understand the decisions made, and decision-makers involved in smallholder agriculture and informal agriculture trade.

Thirdly the thesis sheds light on the trade-off and interdependence of traditional and modern knowledge in informal agriculture markets. Very little is known about what goes on when smallholder traditional farmers bring their traditional knowledge to the market where they haggle for transactions with traders. With many Zimbabweans now working in the informal sector, informal agriculture markets could be major sources of knowledge.

# *Chapter 2 –*

# Knowledge and Learning in the Context of Informal Markets

The topics of knowledge and learning, and the host of related notions cannot be dealt with here in any depth. Nor is it the focus of this thesis to delve into the very difficult questions surrounding them.

This chapter will only provide an overview of those notions that provide the academic background from which the questions that were posed to the farmers and traders were developed. The chapter ends with a list of the actual questions.

## 2.1 Notions of Knowledge

While knowledge is always an abstract, it cannot be divorced from what is going on in real life. However, there is no single, universally agreed definition of knowledge. Numerous competing theories present the definition of knowledge as an endless debate that dates back to ancient Greek philosophers. The definition of knowledge as *justified, true belief* is usually attributed to Plato. On the other hand, the major branch of philosophy dealing with the nature and scope of knowledge – epistemology – continues to be a fertile area of study.

According to leading Knowledge Management practitioners, the term "*knowledge*" means capacity for effective action[19].

Additional definitions include:

"Knowledge consists of truths and beliefs, perspectives and concepts, judgements and expectations, methodologies and know-how and is possessed by humans, agents, or other active entities and is used to receive information and to recognize and identify; analyse, interpret, and evaluate; synthesize and decide; plan, implement, monitor, and adapt – i.e. to act more or less intelligently. In other words, knowledge is used to determine what a specific situation means and how to handle it"[20].

### a) Conceptualizations of Knowledge

As revealed through various definitions, there are diverse ways of conceptualizing knowledge. In this thesis, knowledge is conceptualized from the point of view of its usefulness in such socio-economic aspects as traditional farming and informal agriculture marketing of crops in Zimbabwe. To this end, the concept of **"**useful knowledge" which is a way of understanding knowledge as an economic resource[21], extensively used in studies about the role of knowledge in industrial revolutions[22] is employed in this thesis. Useful knowledge deals with natural phenomena that, potentially lend themselves to manipulation, such as artefacts, materials, energy and living beings. This is knowledge about any regularity or pattern of nature that, potentially, can be applied to generate economic value or benefit for

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[19] Here are some definitions from leading KM practitioners:
"Knowledge is information that changes something or somebody — either by becoming grounds for action, or by making an individual (or an institution) capable of different or more effective action" – Drucker, Peter. The New Realities. Harper & Row, 1989.

"Justified belief that increases an entity's capacity for effective action" – Nonaka, Ikujiro. Organization Science 5(1):14-37 (1994).

"Knowledge… should be evaluated by the decisions or actions to which it leads." – Davenport, Thomas and Prusak, Laurence. Working Knowledge: *How Organizations Manage What They Know*. Harvard Business School Press, 1998.
"I define knowledge as a capacity to act" – Sveiby, Karl Erik. *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets.* Berrett-Koehler Publishers, 1997.
"Knowledge is information in action" – O'Dell, Carla and Grayson, C. Jackson Jr. *If Only We Knew What We Know*. The Free Press, 1998.

[20] Becerra-Fernandez I, Gonzalez A, Sabherwal R. 2004. P.21 on the distinction between data, information and knowledge as well as how knowledge, data and information relate to information systems, decisions and events in *Management Challenges, Solutions and Technologies. Prentice Hall.*

[21] Simon Kuznets (1955). Economic Growth and Income Inequality. The American Economic Review, Vol. 45(1), 1-28.

[22] Joel Mokyr, (2005). *The intellectual origins of modern economic growth.* The Journal of Economic History, *65*(2), 285-351.

human beings. The approach does not focus on the origin of knowledge, that is, on how it is generated, but on the application of existing knowledge to practical issues like farming and informal trading.

Useful knowledge has two subcategories: propositional knowledge and prescriptive knowledge. Propositional knowledge is the type of knowledge that catalogues natural and social phenomena. It refers to a person's ability to 'know what' about nature and society[23]. It explains what things are and how they work. This knowledge is important for making sense of the world. Prescriptive knowledge is the collection of techniques and instructions for manipulating nature and social institutions for human purposes. Both propositional and prescriptive knowledge, have tacit and explicit dimensions.[24] The explicit dimension refers to that part of knowledge that can be codified and expressed through words or using any type of symbols. In other words, explicit knowledge is knowledge that can be expressed under the form of information. The tacit dimension of knowledge refers to that knowledge that cannot be expressed through symbols but becomes visible only through action.

The underlying idea in this research is that knowledge cannot be completely codified which is why what happens in non-formal communities like traditional farmers and informal traders can be considered valid knowledge. "The useful knowledge of a society is defined as the union [sum] of the knowledge of the individuals in that society and whatever is stored in storage devices"[25]. To work with social technologies around agriculture and informal trading, it is convenient to expand the concept of useful knowledge to include non-codified, tacit knowledge that can only be expressed through action.

All communities have huge stocks of knowledge, such as the lessons learned, the practical skills and experience that are stored in the form of behaviour and social norms, and most of this knowledge is tacit. Traditional smallholder farmers and traders use a lot of tacit knowledge in their practice and this knowledge is brought to the market where there are also other forms of tacit knowledge as well as some level of explicit knowledge.

Although modernisation and industrialisation emphasize explicit knowledge (making things explicit through formal education systems), farmers and traders seem to prove that you do not have to understand everything in writing in order to come up with a solution. Action and

[23] Mokyr (2002b). *The gifts of Athena*. Princeton, NJ: Princeton University Press.

[24] Polanyi (2009). *The tacit dimension*. Chicago, IL: University Of Chicago Press.

[25] Mokyr (2002a, p.4). *Useful knowledge as en evolving system: the view from economic history*. Presentation in the Conference "The economy as an evolving system," 2001, Santa Fe, NM. Chicago, IL: North Western University.

interaction can be important in coming up with solutions so much that interaction can replace analysis. In addition, farmers and traders do not have the time and energy to know everything before taking action.

### b) Information and Knowledge

While they are often used interchangeably, there are key differences between the terms *information* and *knowledge.* Whereas information is usually considered independent of any particular individual—it can be looked up in a book or retrieved online—knowledge is usually associated with a knower, that is, it resides in someone's mind. Given this personal attachment, knowledge appears more difficult to detach than information. It's harder, for example, to pick up, write down, and transfer from a farmer or trader than from information. One reason knowledge may be so hard to give and receive is that it seems to be acquired more through assimilation. As farmers and traders show, knowledge is something they digest rather than merely hold. It is usually deeply intertwined with their understanding of the practices surrounding the use of the knowledge.

Knowledge, following Michael Polanyi, can be thought of as having two dimensions: explicit and tacit. The explicit lives in books and in our brains as concepts and facts and deals with the "know-*what*." The tacit deals with the "know-*how*" that is best manifested in work practices and skills. The tacit resides in action, most often in participation with others. In the case of this research, as farmers and traders exchange potatoes or tomatoes with money in the informal market, they also share tacit knowledge. As a consequence, tacit knowledge can be distributed as a shared, socially constructed understanding that emerges from collaboration.

Learning by doing with others offers farmers and traders the opportunity for in-depth enculturation into a particular practice, where one *learns to be* a farmer or a trader, in contrast to just *learning about* such professions. What this implies is that students, like farmers and traders, could absorb the social and practical aspects of a profession (its practices) and gain tremendously from their proximity to practitioners, especially when they can watch, listen, and peripherally participate. Thus we have a case of extrapolation here that can be a necessary component of pedagogy. Enculturation is crucial to such learning, since relatively little of the complex web of practice can effectively be made the subject of explicit instruction. A great deal of knowledge inevitably remains implicit in practice, for instance, in informal markets.

According to Professor Johan Kinghorn[26] people normally think tacit knowledge is individual yet routines and behaviour patterns shared collectively by groups like farmers and traders constitute an important part of tacit knowledge. Also critical in this context are Prof. Kinghorn's ideas on the distinction between embodied knowledge, embedded knowledge and codified knowledge. The tacit knowledge angle in this research borrows from Polanyi who emphasises memory not memorizing. What makes human beings like farmers and traders different from animals is that they have a capacity to create memories for themselves. Animals like dogs and cattle can take long to learn because they live on instinct. On the other hand, human beings such as farmers and traders have logic and can choose to live life the way they want. Memory helps us make some of these decisions. According to Prof. Kinghorn, the key property of knowledge is *memory* (not data as per the materialist view). Memory is an intrinsic, ever alert potential (not a construct from data and information). Knowledge is expressed dynamically in embodied, embedded and codified forms.

Memory is the reservoir of learning. Knowledge, therefore, is rooted in memory, not in data or information. According to Prof. Kinghorn, knowledge is signified in three modes namely, embodied knowledge, embedded knowledge and codified knowledge. This perspective is also useful in looking at the interface between farmers and traders in the informal agriculture market.

### c) Embodied Knowledge

Embodied knowledge is the capacity to act in as much as it is appropriated by human beings through learning. Another way of describing embodied knowledge is to say that it is the individual's and/or community's memory. Because it is intrinsically embodied, it is sometimes referred to as tacit knowledge. Human beings can only partially objectify embodied knowledge – through communication, creativity and performance. Embodied knowledge, among all people, always, at all times is the mode of knowledge that is the foundation of all other knowledge in the human world. Farmers and traders express embodied knowledge in their daily activities.

### d) Embedded Knowledge

Prof. Kinghorn contends that in the history of the world, embedded knowledge is a very recent phenomenon. At the utmost it is 300 years old, but most people have become exposed

[26] Lecture notes, 2014 – explaining the distinctions between embodied knowledge, embedded knowledge and codified knowledge.

to it only in the past 50 years. Embedded knowledge comes about when some embodied knowledge is delegated to an artefact which is constructed for that purpose, and provided with non-human energy to perform that knowledge. The only embodied knowledge that lends itself to be embedded is knowledge that is of scientific origin or scientifically recognised. Embedded knowledge gives the artefact limited capacity to act. Within the designed limitations it acts autonomously and independent of a 'steering hand'. The more advanced a country's economy is today, the more the economy is centred on embedded knowledge. Through mobile phones, farmers and traders express some form of knowledge which has been embedded in mobile technology.

#### e) Codified Knowledge

According to Prof. Kinghorn, codification freezes knowledge into *records of* knowledge. But such records do not have a capacity to act in themselves. Codified knowledge is, nevertheless, an indispensable part of general knowledge dissemination between participants and across generations. Codified knowledge is potential memory. The application of embodied intellectual knowledge is essential to unlock meaning from codification. There is an element of codification in the informal market with a number of farmers and traders now able to keep records of their business activities.

## 2.2 Memory and the notion of Learning

According to Prof. Kinghorn, memory is the capacity to act intelligently, which we build by retaining meaning from moments of past experiences in the belief that their retention is necessary for future action. Memory is forward-looking. It is a state of readiness. In other words, memory is the reservoir of knowledge. Every human being has to *create* his/her own memory through *learning*. Learning is that activity, through which over time, people grow their own intrinsic, capabilities which empower them for action in future. Learning happens when the past is *sifted*, to *decide* what to keep alive *for future use* – and when everything else is deliberately left to disappear with the past.

The role of memory and learning is crucial in investigating the dynamics of knowledge in informal agriculture markets. An informal agriculture market has some level of differentiation shown by different grades of tomatoes and potatoes that are sold in the market depending on customer preferences. Since most of the activities by farmers and traders are tacit, the root of their knowledge is not data or codified information but memory. Their memory increases and improves through informal learning. Informal agriculture markets

provide an environment for informal conceptions of knowledge based on enabling learners (farmers and traders) to construct knowledge by drawing from a range of information that enables them to obtain greater depths of understanding which they can apply in new situations depending on their memory. Activities in the market thrive on memory. That is why when farmers plant potato seed they get potatoes and the cycle continues. Since they are conscious of their memory, farmers have the capacity to manage their memory.

## 2.3 The notion of Trust

Besides memory, trust plays an important role in the informal economy. Researchers in many fields like sociology, psychology, philosophy, economy and politics have tried to craft a general definition of trust. Trust is defined as the willingness to be vulnerable to the actions of another party based on positive expectations regarding the motivation and behaviour of the other. Trust increases when the other party is perceived as having integrity. Trust has been widely recognized as a key enabler of organizational success. Different antecedents of trust (benevolence, integrity, competence, reliability, transparency, and identification) are relevant for different stakeholder types, and provide strong support for the validity of the intensity and locus dimensions. As a key enabler of organizational success, trust has been shown to facilitate efficient business transactions[27], increase customer satisfaction[28], and enhance employee satisfaction. More generally, trust promotes cooperative behaviour within organizations and between organizational stakeholder groups, as it fosters commitment and motivation[29] along with creativity, innovation and knowledge transfer.[30]

While definitions of trust vary across disciplines[31], most conceptualizations of trust include the element of risk or vulnerability. In particular, trust exists when parties are willing to make themselves vulnerable to the discretionary behaviour of others. Trust, however, is context-

[27] Williamson, 1988; Williamson, 1993; Noteboom, 1996. Williamson, O. E. (1988). "Corporate Finance and Corporate Governance." Journal of Finance XLIII (3): 567-91. Williamson, O. E. (1993). "Calculativeness, trust, and economic organization." Journal of Law and Economics 36(1): 453-486. Noteboom, B. (1996). "Trust, opportunism and governance: a process and control model." Organizational Studies 17(6): 985–1010.

[28] Dwyer, Schurr et al., 1987; Ganesan, 1994; Morgan and Hunt, 1994; Doney and Cannon, 1997; Geyskens, Steenkamp et al., 1999. Dwyer, F. R., P. H. Schurr, et al. (1987). "Developing buyer-seller relationships." Journal of Marketing. 51(2): 11-27.

[29] Ganesan, S. 1994. "Determinants of long-term orientation in buyer-seller relationships." Journal of Marketing (April): 1-19.

[30] Nahapiet, J. and S. Ghoshal , 1998. "Social capital, intellectual capital, and the organizational advantage." Academy of Management Review 23(2): 242-266.

[31] Rousseau, D. M., S. B. Sitkin, et al., 1998. "Not so different after all: A cross-discipline view of trust." Academy of Management Review, 233): 393-405.

specific.[32] Depending on the situation, there are several potential attributions which might serve as antecedents of trust.[33] The three antecedents of trust are identified as "ability", "benevolence" and "integrity"

Farmers, traders and consumers in informal agriculture markets embrace trust and its antecedents. Where researchers have found competence-based trust relevant to stakeholders that must rely on the organization's ability to perform in the manner that is expected or promised, farmers and traders trust the ability of the informal market to deliver high quality agricultural commodities and satisfy their needs. By ensuring a steady supply of commodities, smallholder farmers have built a trustful track record with traders and consumers.

Benevolence-based trust stems from the belief that an organization cares about a particular stakeholder and will thus act in ways that are in that stakeholder's best interest. The informal auction system in the informal agriculture market speaks to transparency-based trust by ensuring farmers actually see the prices on offer on a particular day and also get feedback from consumers. This ensures transparency and enhances trust.

### a) Angle to learning

By relying on an informal information system, trust and memory, the informal economy has a different angle into learning from the formal economy. While formal learning has largely been influenced by Bloom's Taxonomy[34] , the informal economy thrives on informal learning and informal thinking. Bloom's Taxonomy is only relevant to the informal economy where the taxonomy elevates the role of memory in learning. After almost 50 years, Bloom's taxonomy is still being used by formal educators and trainers as a pedagogical tool for the analysis of learning objectives. Originally designed as a method for the development of test questions, the taxonomy's six levels of the cognitive domain (knowledge, comprehension, application, analysis, synthesis, and evaluation) have become almost standard in the learning business.

Some elements of Bloom's taxonomy's three domains of learning (Cognitive - mental skills (*Knowledge*); Affective - growth in feelings or emotional areas (*Attitude*); and Psychomotor -

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[32] Coleman, J. S. (1990). Foundations of Social Theory. Cambridge, Harvard University Press.

[33] Boersma, M. F., P. J. Buckley, et al., 2003. "Trust in international joint venture relationships." Journal of Business Research (56): 1031-1042.

[34] Benjamin Bloom, 1956. *Taxonomy of Educational Objectives Handbook 1*: The Cognitive Domain. New York: David McKay Co Inc. Website:http://www.nwlink.com/~donclark/hrd/bloom.html

manual or physical skills (*Skills*)), apply to the informal economy. Farmers and traders do a lot of remembering, interpretation and evaluation in the informal economy. In essence, Zimbabwe's education system has focused on the intellect (intellectual), ignoring the other parts which are mainly prevalent in the informal economy as shown in Chapters 4 and 5.

## 2.4 Questions for interviews

***Knowledge practice questions for farmers***

1. How do you produce tomatoes/potatoes that you sell to the market?
2. When do you produce the crops?
3. Why do you produce those crops?
4. Where do you learn to produce the crops?
5. Is it difficult to produce the crops?
6. How long did it take you to learn how to produce the crops?
7. How many people in your family or community can produce the crops?
8. Do you teach your children to produce crops for the market?

***Comparative questions for farmers***

9. How does your practice differ from that of commercial farmers?
10. Do you try to emulate/copy commercial farmers?
11. Why do you do things differently?
12. Will you do the same as commercial farmers if you have the opportunity?
13. How does your practice compare with other traditional farmers?
14. Do you talk about your differences with other farmers?

***Knowledge practice questions for informal traders***

1. How do you obtain potatoes/tomatoes that you sell to the market?
2. When do you procure the crops?
3. Why do you procure those crops?
4. Where do you learn to procure the crops?
5. Is it difficult to procure the crops?

6. How long did it take you to learn how to procure the crops?
7. How many people in your family or community can procure the crops?
8. Do you teach your children to procure crops for the market?

***Comparative questions for traders***

9. How does your practice differ from that of commercial companies and formal buyers?
10. Do you try to emulate/copy commercial companies?
11. Why do you do things differently?
12. Will you do the same as commercial companies if you have the opportunity?
13. How does your practice compare with other informal traders?
14. Do you talk about your differences with other traders?

# *Chapter 3 –*
# Data Collection Methodology

## 3.1 Methodology

The research methodology was qualitative in nature.

"Qualitative research, also called naturalistic inquiry, developed within the social and human sciences, and refers to theories on interpretation (hermeneutics) and human experience (phenomenology). They include various strategies for systematic collection, organization and interpretation of textual material obtained while talking with people or through observation. The aim of such research is to investigate the meaning of social phenomena as experienced by the people themselves."[35]

"Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials – case study, personal experience, introspective, life story,

[35] Malterud, 2001, p. 398. The art and science of clinical knowledge: Evidence beyond measures and numbers. The Lancet. 358: 397-400.

interview, observational, historical, interactional and visual texts – that describe routine and problematic moments and meanings in individuals' lives." [36]

Empirical research was conducted over a five month period from July to December 2014 covering 42 participants (24 farmers and 18 traders) from across three markets and three farming communities. The qualitative approaches of interviewing, observation and focus group discussion were used to explore the behaviour, perspectives and experiences of farmers and traders in these markets and communities. Some farmers and traders volunteered to be tape-recorded and the researcher went on to record some of the conversations. The recordings are, however, not for publication in respect of ethical standards.

Tomatoes and potatoes were the main crops around which the investigation was woven. While secondary data were collected from the literature review, primary data was gathered from farmers and traders in three informal agriculture markets namely: Mbare (Harare), Sakubva (Mutare) and Bulawayo Up-market Traders Association (BUTA) (Bulawayo). Information was also collected from farmers in farming communities close to the markets: Mutoko where farmers grow and bring tomatoes and potatoes to Harare; Mutasa where farmers grow and from where they bring agricultural commodities to Sakubva Market in Mutare as well as Esigodini where some horticulture crops that go to Bulawayo market are produced.

The interview questions for farmers focused on two cropping seasons (2012/2013 and 2013/2014) in order to get complete information from production to marketing. Purposive sampling was used in order to get various strata for various commodities and markets. A purposive sampling method was used based on the geographic distribution of farming communities and markets within urban centres and various traders within each market. Within markets, a sample of traders was drawn based on their type of business as well as parameters that included type of commodity traded, ownership (gender, age, level of education etc.,.) and size of business (volume traded, number of employees etc.). A separate group of 28 traders also participated in three focus group discussions (12 in Harare, 8 in Mutare and 8 in Bulawayo).

## 3.2 Premise of the research

[36] Denzin, NK & Lincoln, YS, 1994, "Introduction: Entering the field of qualitative research." Handbook of Qualitative Research. pp. 1-18. Thousand Oaks: Sage.

The premise of the research was that in the informal world there is a specific knowledge capacity to produce things and to trade those things. Where in the formal system money is the main medium of exchange, the informal sector has to work on a different basis. There is a world of knowledge out there around the use of barter trade as well as relationships and trust to support it.

Some of the underlying questions include: How do we understand activities that fall outside our formal understanding of the world? There is an exchange of expectations and anticipations in the informal world. Are farmers and traders changing because they have learnt something or just adjusting to fashions? The research tries to understand processes affecting half of the world population which work in the informal sector. How does the informal world interface with the formal world? By answering some of these questions, the research will contribute to the developing world.

Farmers and traders answered the researchers' questions based on how they produce tomatoes and potatoes as well as the challenges they face and how they surmount those challenges. In addition to individual interviews, Focus Group Discussions were used to generate detailed evidence towards figuring out consensus knowledge where it existed.

Since the researcher was investigating a public issue in the public domain, there was no need for any ethical clearance. The respondents trusted the researcher enough to explain issues beyond the questions posed. To keep the respondents anonymous, the researcher allocated respondents an anonymous identification numbers and then engaged in interviews. This ensured that respondents would not be traceable, in accordance with ethical obligations. The questioning was informal and relaxed. The research had more of an objective than a survey and answers came from the respondents. To counter the leading question dilemma, the researcher paralleled the research with objective data on quantities of potatoes and tomatoes that farmers left at home and those brought to the market. Every respondent was approached differently with the researcher focusing on depth. The respondents were proxies for a much larger informal agriculture trade phenomenon.

The researcher's angle into learning was finding out if farmers change their production methods as a result of interacting with traders and do not just change by way of adjusting to fashions. In other words, do farmers go through real change observable in practice and demonstrated by their growing or producing more or differently. Changing in activities could be an indicator of learning or knowledge. Conclusions were drawn from listening, writing

notes, observing, focus group discussions and interpretation. At least three interviews were conducted a day to avoid confusion and forgetting some of the details.

## 3.3 Delimitation of the research

The research focused on traditional smallholder farmers who still produce crops the traditional way in communal areas. Newly resettled and peri-urban farmers, who may have been influenced by industrial agriculture, were excluded from the research. This delimitation was intended to get detailed information rather than just scratch the surface.

## 3.4 Limitations of the research

The main limitation of the research was focusing on two crops (tomatoes and potatoes) given that the informal market has more than 70 different commodities circulating in the market daily. However, the strength of this approach was getting detailed knowledge from two crops rather than spreading resources thinly to all commodities in the market, perhaps resulting in too generalized findings. Some of the commodities such as cabbages, butternuts, leafy vegetables, carrots, groundnuts and sugar beans were mentioned in the research to the extent that they influenced production and marketing of potatoes and tomatoes. Another limitation was that of focusing on few respondents. However, this was important for getting deep and detailed information as opposed to the shallow and general patterns. During the empirical work, farmers and traders were willing and open to share since they had already interfaced with NGOs and extension officers. The stories were voluntarily given by the farmers and traders. Details of the data collection are covered in Chapters 4 and 5.

# *Chapter 4:*

# The Voice of the Farmers

The qualitative research methodology involving interviews, observation and focus group discussions generated diverse insights that form this chapter. Each interview started with greetings and introductions. The researcher then explained the purpose of the interview and how the information gathered would be used. From the introduction, the researcher was able to gain the interest and cooperation of the respondents without biasing the respondents' answers. The researcher emphasized the fact that the interview results would remain confidential (in the sense that the name of the informant would not be associated with the answers collected). Farmers were asked knowledge practice questions and comparative questions. The set of interview questions for farmers is shown in Chapter 2 on Scope of Work and Methodology.

## 4.1 Farmer 1 – Good seed is the major determinant of success

Based on many years of practising traditional (smallholder) agriculture in a remote rural district of Zimbabwe, Farmer 1 could be classified as a traditional farmer. When the researcher posed the difficult question regarding potato production, the farmer responded by saying: In potato, good seed is the major determinant of success[37]. The market tells me sources of the best seed. Potato seed has its limits no matter how much inputs you add. In Zimbabwe *BP1* is the most popular variety. Mbare Market gives me guidelines on what is required in terms of quantity – volume, turnover in aggregate terms and in individual farmer terms. If another farmer brings tons of potatoes to the market, I get this information from the

[37] The role of good seed in agriculture is also expanded by ALMEKINDERS, C.J.M, LOUWAARA, N.P. 2002. The importance of the farmers' seed Systems in a functional national seed sector. *Journal of New Seeds*, 4, 15 – 33.

market. Since competing farmers come from different areas, without visiting the market, it is difficult to know the volume or quality of potatoes being brought to the market by your competitors. You can only get this information if you come to the market and care to ask. The market is the barometer for quality, quantity and timing of delivery. It also shows me customers, volume of purchases, frequency and quality demanded by customers.

Farmer 1 told the researcher that when he first came to the market in 2007 he had planted a variety called Ameithest. The market showed him that a variety called *BP1* was more on demand because of a preferred skin quality (clean) and tuber size. Ameithest had some bit of scars which were not preferred by many consumers who consider skin quality a favourable attribute. *BP1* has a whitish finish. Other farmers who were selling potatoes from *BP1* seed variety gave Farmer 1 production information. The farmer also got to know about other varieties like Diamond, KY20, Garnet and Jaspar.

The market was a major source of knowledge for Farmer 1 because seed suppliers and distributor shops from which farmers buy seed have no practical experience on how potato varieties perform in different contexts. By seeing them on the market, Farmer 1 became aware of the characteristics of other varieties. For example, KY20 has a longish shape like sweet potato. Learning about potato varieties from fellow farmers enabled the farmer to get unbiased practical knowledge than he would have obtained from potato seed merchants who will never tell you about the side-effects of their seed.

According to Farmer 1, the informal market also tells a farmer when to plant, when demand is high as well as trends during months potatoes are in high demand and why. Farmer 1 got to know that the highest demand and prices for potatoes is in October which is the peak period. The market showed the farmer how to produce for a target customer by learning from each consumer category. Vendors prefer medium-sized potatoes that are easy to sell in piles along road sides. Here Ametheist is a good variety. Fast food chains and restaurants want large potatoes for chips. Here *BP1* does better. The same fast food chain tells a farmer that a variety called Mondial is not good for chips as the chips do not last and quickly go bad; their taste is not good either.

Based on feedback from the market, indicating the importance of target marketing, farmer 1 went to the farm and adjusted spacing which he learnt has a bearing on potato tuber size. Increasing spacing from 20 – 25cm gives bigger tubers for *BP1*. Bigger tubers are required by fast food chains. Decreasing spacing to 18cm gives small to medium tubers. Seed producers

go as far as 15cm. Small tubers produced from narrower spacing produce tubers that are suitable for vendors. Besides other farmers, the main sources of advice for Farmer 1 were the shadowy traders called *makonyera* who convey information on which other farmers have planted and when they will start harvesting for the market. Through traders, farmers get to know the levels of competition in terms of hectares planted by other farmers. This has prompted Farmer 1 to stop, watch and monitor production and market trends strategically before deciding to plant potatoes.

### 4.2 Farmer 2 – The market as a price setter

For Farmer 2, one of the biggest insights from Sakubva Market in Mutare has been how to price his commodities. Like most farmers, Farmer 2 used to confuse the retail price with the producer (farm gate) price because he lacked information on the actual price on the market. The market provides a pricing guide depending on demand of products on the market. Farmer 2 initially priced his potatoes as follows:

Large - $12/pocket; Medium - $10/pocket and Small - $8/pocket. The market advised him to adjust as follows: Large - $9/10; Medium - $8 and small - $5/6 per pocket. The market will not take commodities at prices above these prices which end up being standard prices. Just as potatoes will not achieve beyond certain genetic potential even if you continue supplying inputs, the informal market will not go beyond a certain standard price in line with supply, demand and the circulation of money.

In line with the market, Farmer 2 went back and adjusted his production. He changed the type of fertilizer from Compound D to Compounds C and Compound S. He also increased the amount of fertiliser after learning from the market that more fertilizer translates to more yields particularly for good varieties. More fertiliser also leads to good quality potatoes. “If you do not know how other farmers grow you w ill not compete strategically”, he said. Farmer 2 also learnt a lot about packaging: (a) pocket size has to be 15kg polythene bag; (b) the type of pocket has to be attractive, allowing potatoes to be seen; (c) pocket durability; and (d) sources of packaging. Farmer 2 is now able to package correctly according to customer requirements. From the market Farmer 2 also learnt that volume is more important than weight which is why potatoes are sold in pockets not kilogrammes.

### 4.3 Farmer 3 – The market as a source of new knowledge

Farmer 3 got to know about many other tomato varieties by visiting Sakubva Market in Mutare. Initially Respondent 3 used to produce his own tomato varieties from the previous crop. Besides discovering that you can’t put a lot of inputs on old varieties and expect higher

yields, the farmer came across popular varieties like Rodate in the market when he had brought his own variety called Thomas. He discovered Rodate is the preferred household variety because of its high soup yield. He also got to know about a Jam tomato called HTX14 used mainly for processing.

Most importantly, Farmer 3 learnt from other farmers how to produce tomatoes well. He visited areas where farmers who brought attractive tomatoes to the market come from in order to learn. At his plot, Farmer 3 had planted one hectare of Rodate, harvesting 1243 boxes from 15 000 plants from one hectare. Upon visiting other farmers he had met at the market, he discovered they were harvesting 1 800 boxes from 2000 plants. Part of the trick practised by these successful farmers related to correct land preparation, fertilizer application, grading, type of fertilizer (high potash e.g., Compound C); regular application of basal fertilizers (Compound C) in small quantities every three weeks and application of Ammonium Nitrate after every harvest (in small quantities) to boost yield.

Farmer 3 also learnt not to plant in hectares but in blocks of 2000 to 5000 plants that can be easily managed to get higher and superior yields. In addition, he learnt box trellising rather than tying the tomatoes to sticks. He also learnt that one hectare is too big for spraying, trellising, weed management, fertilizing as well as harvesting. You do not want the whole crop maturing at the same time in a flash when the market tells you the quantity of tomatoes it takes at a given time. The market and other farmers taught Farmer 3 to stagger production instead of wasting inputs through commodities that will not be consumed but thrown away due to market saturation.

The farmer also learnt that new knowledge on watershed management will keep commodities flowing to the market every day. In addition, the market showed the farmer cases where irrigation and intense rainfall wash away the most valuable topsoil, thus affecting tomato yields. Information from the market is critical in supporting market-based livelihoods.

Through the informal market, Farmer 3 learnt that farmers try to simplify things for themselves by identifying easier crops to grow first before venturing into the complicated ones. Choosing companion crops also involves market-based decisions. For example, tomato farmers tend to partner the crop with cabbage so that consumers can get everything from one farmer. Thinking in terms of companion-cropping also helps in spreading risk. Traditional farming has become a natural process of learning rather than embracing 10 different crops at once. Nutrition, market resilience and ecosystem balance is a key

consideration for farmers. Part of the simplifying process for farmers is relay-cropping. Where there is evidence that animal-based protein is missing, farmers try to keep livestock that complement crops grown. This is a purely nutrition-driven decision based on insights from the market. Informal markets are more resilient than formal ones. Rather than focusing on consistence of supply, informal markets consider feasible or sustainable patterns of supply that can be negotiated with buyers as opposed to locking themselves in inflexible contractual relationships, according to farmer 3.

Farmer 3 has also learnt to grow tomatoes and groundnuts as companion crops. While importation of groundnuts from Malawi by processors has affected groundnut production, the farmer has adapted by selling tomatoes. Malawian groundnuts arrive in Zimbabwe at US$700 a ton when local farmers would want to get at least US$1000 per ton. It is cheaper to produce groundnuts in Malawi because they use the Kwacha. On the other hand, because of the same climatic conditions, Malawian farmers produce the same groundnut (*Kasawaya*) produced in Buhera and other Zimbabwean districts. Farmer 3 has learnt to become a patient entrepreneur. The market teaches you to handle pressure and deal with situations that require patience, according to farmer 3.

The farmer also became aware that sugar bean affects tomatoes because tomatoes are involved in the consumption of sugar beans by consumers. The introduction of pre-paid electricity meters by the Zimbabwe Electricity Supply Authority (ZESA) resulted in more consumers reducing their buying of sugar beans which take much longer to cook and thus have a negative bearing on energy. Many consumers have now switched to potatoes, cabbages, peas and other commodities that are easier to cook for relish. This information is transmitted to farmers through traders. Farmers who do not come to the market have no chance of responding quickly to this dynamic and may continue producing sugar beans when the market has changed its mind.

### 4.4 Farmer 4 – Customer preferences drive the market

Farmer 4 acquired packaging knowledge from the Bulawayo Up-market Traders Association (BUTA) market in Bulawayo where she trades both tomatoes and potatoes. According to Farmer 4, she learned that customers have their own preferences. Vendors want to buy in wooden boxes (7-8kg) because they can estimate the number of fruits in each box since they sell by number of fruits. According to respondent 4, if well-packed, a box contains 52 large fruits, the small fruit size will be 64 fruits in a box followed by 72 fruits, 84 fruits and 100 – 120 small fruits filling up a box respectively. Farmer 4 also discovered that vendors always

aim for 100% profit. If a vendor buys a box of tomatoes for $6/box, s/he aims to earn $12. Another lesson for Farmer 4 was that wholesalers and traders want to buy in plastic boxes called Sandaks weighing 18 – 20 kg because they repack. Sandaks are also convenient to transport. In addition, wholesalers find it easier to estimate the weight of a Sandak than of a wooden box.

The informal market also enabled Farmer 4 to understand market requirements and standards. Key considerations she now takes into account include understanding the needs of the customers (general public); the Product (quality, taste, perishableness and what makes a product, etc); Price (her own costing versus selling price); Place (physical location and channels of communication with the market); Promotion (she now makes an effort to be known before taking commodities to the market); and, Production capacity (she now realizes the importance of volume in order to enjoy economies of scale). Before understanding the market fully, she used to incur 60% of the costs through post-harvest handling, transportation and marketing. Her losses have now been lowered to10%.

According to Farmer 4, if a farmer does not know his/her customers you s/he will continue producing using his/her own instincts. This leads to a mismatch with what is required on the market. Where there is a mismatch farmers tend to lose because they have less bargaining power. She now knows that favourable prices depend on other factors and not just on supply and demand. For example, quality of products and how you promote yourself can make a difference. When you have high volumes you do not worry much about price because you enjoy economies of scale.

### 4.5 Farmer 5 – The importance of counting number of fruits

Farmer 5 was taught by other farmers that she met at the BUTA market in Bulawayo, how to count fruits as they grow on the plant. For Rodate she can now fill a box with three plants. She has also learnt about other varieties of hybrids like Nemoneta, Star – 9009; 9006; 9003), Royale Plus, Opale, Calistar (jam tomato). She is now planting Royale Plus and Star 9009. For hybrids she can now fill one box per plant which is quite a big achievement. However, if done well, she has realized a farmer can achieve one and a third box per plant. For Farmer 5, the market also influences the production of other crops like cabbages and carrots. She has discovered that you get more if you tie 25 carrots into one bunch. If planted correctly (30cm apart), carrots can give you $30 –$ 40 000/hectare.

Other farmers she met at the market taught Farmer 5 that volume of crops to be grown is determined by the availability of inputs. The more inputs the higher the volumes. Crops mainly grown with surplus fertiliser for sale include tomatoes, leafy vegetables, bananas, groundnuts, maize, and butternuts among others. When selling products to the markets, farmers expect to attain favourable prices. However, the demand for the produce determines the prices. The more the supply of produce, the lower the price and if there is a high demand of the commodity prices often go up.

The informal market also enabled Farmer 5 to become aware that price is just an indicator of a medium of exchange mostly in the form of money. But where you engage in barter trade, the value is embedded. For example, a bucket of groundnuts can be exchanged for a crate of tomatoes. Rather than depend on price, she now sometimes resorts to commodity exchange. This is important in the current liquidity crunch. She has also become aware that the true or intrinsic value of tomatoes and other commodities emerges where barter trade is involved. As for the price, with all other characteristics constant, it fluctuates from say, $1 to $5 as if the value of the commodities fluctuates that way. According to Farmer 5, the true value of a tomato is the highest price it can fetch at any given time.

### 4.6 Farmer 6 – How the market is driven by relationships

This farmer has been growing tomatoes for more than 10 years and has developed a strong relationship with traders, most of whom come to collect the commodity from his communal farm. Sometimes he supplies the traders' who then send his money after selling. This allows Farmer 6 to do what he is good at (farming) while the trader concentrates on what he is good at (selling, trading and deal making). According to Farmer 6, most of his neighbours are afraid of traders and feel that when traders dictate prices, it is a sign of market failure. However, some of the information that Farmer 6 has exchanged with traders includes information on quality and on the varieties to produce as well as the time to produce the crop.

The informal market also enabled Farmer 6 to see the role of wild fruits in the performance of tomatoes and other agriculture commodities in the market. There is competition for cash between commodities in the informal market, according to Farmer 6. When abundant, wild fruits like *mazhanje* compete directly with horticultural commodities like tomatoes and potatoes thus shrinking the market size for these crops. Consumers who come to the market intending to buy a box of tomatoes change their mind when they suddenly see fresh wild fruits. They often decide to split their budgets between tomatoes and *masawu,* for instance. This means the consumer will spend slightly less on tomatoes in order to accommodate

*masawu.* The implication of this is that a farmer has to also monitor trends on the availability of wild fruit on the market.

The farmer has also become aware of complementary commodities in the market. For instance, a shortage of tomatoes on the market means the price goes up. But tomatoes go with cabbages for the same consumer budget. Where at one time a buyer buys a box of tomatoes and two cabbages, an increase in the price of tomatoes will mean a reduction in the number of cabbages bought. Consumers do not buy more cabbages than tomatoes because tomatoes have more uses than cabbages. Through the informal market, Farmer 6 has also learnt that consumers divide commodities into necessities and luxuries. The majority of consumers consider carrots, fresh peas, butternuts and some fruits to be luxuries which one can do without. Therefore, an increase in the price of a necessity like tomato translates into less expenditure on luxuries as resources are then directed towards necessities. This may have nothing to do with a glut of luxury commodities but everything to do with a shifting of the budget from luxury to necessity products.

A shortage in one commodity, especially a necessity will result in less demand for luxuries. A vendor who brings US$20 to buy two boxes of tomatoes at US$5 each and a crate of bananas at US$10 but finds the price of tomatoes to have doubled to $10 per box, will forgo a crate of bananas and still buy two boxes of tomatoes at US$10 each. This results in the fall of the price of bananas. According to the farmer, this is partly why farmers need a holistic approach to market trends and analysis rather than focusing on partial answers that consider commodities in isolation. Most consumers come to the market with a balanced nutrition mind set. Farmers and traders who understand this mind set can assemble commodities that will automatically suit the needs of consumers and earn better income than farmers bringing single items into the market. Any changes in the price of one commodity will affect the performance of the other. The informal market enabled the farmer to interact with consumers and traders towards gathering all these insights.

### 4.7 Farmer 7 – How information improves production practices

This farmer has learnt skills in deal-making from traders so much that he now makes decisions on the basis of what the traders are not saying. The farmer has learnt that when traders said his crop was of poor quality but kept coming to buy, it was a sign that they wanted him to lower his price to the traders' advantage. However on the other side, the information has enabled him to improve the quality of his products after being told to give preference to the Rio Grande tomato variety which has since improved his quality and

incomes. The market has also given Farmer 7 an observation space where he could observe how tomatoes from other areas like *Macheke* had a longer shelf life. This helped in price bargaining as opposed to continuous production of tomatoes with a short shelf life which he ended up selling for a give-away before the product goes bad.

Before venturing into Rio Grande, Farmer 7 grew Rodate, Resole and Roma. Rodate was not favoured due to its short shelf life and its size was not conducive for informal traders since it did not fit well into crates or sandaks. On the other hand, Roma and Rossol produced small fruits and also had shorter shelf life than Rio Grande. This knowledge has since improved the farmer's income as the number of fruits that rot in the field have been reduced.

Farmer 7 has also realized that when mangoes are in glut they reduce household consumption of tomatoes and other commodities. While the change in the food basket of a household tends to affect the competitiveness of other products, for instance, where households switch from tomatoes to fruits resulting in less competitiveness of tomato trading in the market, there is often an introduction of balanced nutrition in the household instead of relying on one commodity all the time. A fall in the price of some basic necessities like tomato increases the nutritional balance as the same budget can now buy more other commodities like fruits. When people consume fruits like mangoes or oranges, it means they sometimes skip lunch which means less cooking of tomato-based relish like meat or beans. This also means less tomatoes bought. Contrary to basic market training which says supply and demand always affect price, the informal market shows that sometimes demand can go up while price remains constant or falls depending on the adjustment in supply. Consumers can shift the tomato budget to fruits without affecting the price of tomatoes.

### 4.8 Farmer 8 – The importance of matching cropping and market calendars

The main benefit from the market for Farmer 8 was the cropping calendar gained through observation and sharing with the traders. The farmer's business has improved through increased income. He previously suffered losses due to unfavourable prices in his first three years of potato farming. Another benefit from coming to the market has been an understanding of how commodities are graded and how this influences pricing and production. The farmer acquired knowledge on grading tomatoes and potatoes for the market. Information and knowledge on these various niches was obtained through verbal communication and observation together with use of technologies like mobile phones. The farmer has also learnt the importance of samples. Farmers who deal in horticulture have to bring three samples to traders: small, medium and large, e.g., potatoes.

According to Farmer 8, negotiations on-farm tend to be at the disadvantage of the farmer because there will only be one buyer. Traders operate differently. Some take commodities at once while others deal in consignment stocks. The farmer is also now aware that you have to incur losses in order to know standards, quality and profit. Practice is the best teacher. Some farmers get their indicators from market surveys while those who have been on the market for a long time are able to follow and study the trends on their own. When there is a glut in the market it is the right time to plant because a glut is always followed by scarcity of commodities in the market. Consistency counts. Too much rain is not good for tomatoes, potatoes and other horticulture commodities. Every year the demand for cabbages starts increasing in February. As a farmer, you have to learn through continuous improvement and practice. Farmers are worried about three things: price; buyer (who can take my commodities?); and, transport (should I take commodities to the market or buyers will come and fetch them?). According to Farmer 8, by allowing practical wisdom to shine, the informal market shows how common sense sometimes leads to better solutions.

Farmer 8 has also learnt the importance of data and crafting specific budgets. While input providers (seed and fertilizer companies) and farmer organizations tend to design generic or standard budgets based on inputs required, Farmer 8 now uses budgets that are specific to his context. Through the market, traditional farmers are now approaching budgets from the point of yield target because yield will determine inputs. High yields require high inputs and vice versa. They now know that tomatoes grown in heavy soils require less input as compared to sandy soils. Sandy soils tend to require high inputs and nitrogen due to leaching. Potassium and phosphorus are often also in the soil. Most horticultural crops require nitrogen and potash but less phosphorus. This determines yield levels. Quality and size are determined by Nitrogen and Potash. Also key are trace elements: Boron, Zinc and Manganese which are required in small quantities. Usually these are not bought independently over the counter but are blended in the fertilizer. Trace elements are important and that is why farmers like Farmer 8 do not want Compound D in horticulture.

Market-based budgets have taught Respondent 8 that to produce one cabbage you need 80c. However, fertilizer companies do not provide complete information for farmers. For instance, there is no clarity on the amount of Ammonium Nitrate needed by a plant. If a plant needs 7 grams of Nitrogen do not give it more than it requires. Fewer roots mean less nutrition consumption by plants. As the plant grows it wants more phosphorus. Fruit development means more calcium will be needed.

From other farmers in the market, the farmer also learnt about the importance of soil analysis. The majority of farmers do not conduct any soil analysis and this means there is no understanding of soils. Soil analysis should be done when planting every new crop. Quality is a major determining factor on the market. A tomato that lacks calcium is too soft and has a shorter lifespan on the market. Lack of calcium also causes blossom end rot (wounds) mainly resulting from lack of calcium and boron. Uneven ripening is also due to lack of calcium and others nutrients. The customer will question the tomato's capacity to produce good soup. By just observing the fruit, customers can look at and disapprove of the tomato's ripening process. A smooth skin is due to a lack of potash. Potatoes with SOP and those without have different skins. The customer looks at size and skin. Nitrogen is a growth stimulant that makes the plant healthy while stem size determine cob size when it comes to maize.

The market has also enabled the farmer to become aware of new sulphur called *Chidhaka.* However, companies do not have adequate advice regarding the stage farmers should apply sulphur. Since surplus of horticulture crops is outstripping demand, farmer 8 has learnt that farmers have to start thinking in terms of plant population not hectares.

### 4.9 Farmer 9 – The evolution of packaging and grading in the informal market

The farmer has been growing tomatoes for the past 19 years during which period he has seen the evolution of relationships and interdependencies between farmers and traders. According to this farmer, the history of packaging materials like wooden boxes has resulted from agreements between traders and farmers on how the exchange of commodities could be done fairly. Initially, the wooden boxes used on the market weighed over 15 kilogrammes but the current ones weigh between 8kgs to 10kgs. Farmer 9 also learnt that the packaging of tomatoes is done according to grades. These grades are agreed upon through consensus between farmers and traders. While farmers organize their commodities according to grades A, Grade B and Grade C, the language at the market changes to: Superior grade (A), Grade B and Economy grade (grade C) with Superior and Grade B being the most preferred.

As a result of his sharing face to face information with fellow farmers and traders in the informal market, Farmer 9 is convinced that Zimbabwe should shift from an input provision approach to a value addition and sustainable markets approach. Farmers should not grow what does not have a market. From the informal market, there is also a consensus among farmers that rainfall distribution in space and time has changed although annual distribution has sometimes remained the same. On the other hand, there is an upsurge in irrigation

technology, for example engines from China that are sometimes leading to gluts of tomatoes on the market.

### 4.10 Farmer 10 – How the tomato has become a dominant staple

The farmer has been delivering tomatoes to the BUTA market in Bulawayo market for the past 10 years. He has cultivated a mutual relationship with various traders to the extent of sharing information on prices through the mobile phone while he is at home. By observing the market, the farmer has realized that the tomato is now more of a staple with many households serving it. It is required all year round and the market informs farmers when the product is in high or short supply. Farmer 10 has learnt has acquired knowledge from traders on which seasons are ideal to grow the crop. During rainy seasons, tomatoes do not do well and this is the period when few farmers produce more tomatoes to satisfy high demand. Increasing knowledge and information is translating to more supply on the market thus sometimes leading to gluts.

Farmer 10 has also perfected tomato production as a business due to the knowledge he has acquired from the market. The farmer has also learnt about the importance of irrigation from other farmers who bring superior products on the market. Some of the farmers who do well on the market use drip irrigation. While farmer 10, initially thought the drip irrigation system was expensive and unaffordable, the farmers he met at the market showed him how it is cheap and affordable. The farmer learnt that, once set up, a simple drip system can enable him to produce at least three horticultural crops per year, realizing at least US$5500 income. Drip irrigation is now enabling Farmer 10 to produce tomatoes (September – January); Onion (March – July) and Green maize/water melons or lettuce (July – September) every year.

### 4.11 Farmer 11 – Collective use of resources can lead to profitability

Farmer 11 realized that during the dry season most rural families will not be productive. These farmers can use that idle time to form groups and help each other engage in collective production by sharing resources such as cattle, scotch carts, water carts and drip kits to produce horticulture crops and maize. The farmer learnt that doing things well and meticulously is the only way traditional agriculture can be profitable. During the dry periods of the farming season – (July- October) farmers still continue to get water for drinking, household use, washing (laundry) and livestock. It is the same source that can provide water for drip irrigation. This can contribute to horticulture production and early summer maize germination, thus mitigating effects of drought.

The market taught Farmer 11 how careful use of fertilizer translates to better prices and high income on the market. A bag of Compound 'D' and another bag of Ammonium Nitrate can transform lives according to Farmer 11. While some people have said this fertiliser is not enough, he has realized that in fact, it is more than what a serious farmer requires. One bag of fertiliser can cover potato and tomato production as well as maize. With proper knowledge, fertilizer and other inputs can be efficiently used to improve household incomes while also meeting food security needs.

### 4.12 Farmer 12 – How the market has modified farmer behaviour

The market enabled Farmer 12 to become aware of other major players in the horticulture sector. According to Farmer 12, the major problem at the moment is an institutional vacuum in terms of marketing. She asserts that you do not just plant potatoes and tomatoes without a market. If the export market collapses, the varieties designed for export end up being sold at half the price on the domestic market because the domestic market has its own varieties. One of the problems is that there is no guarantee of who can take large volumes if many farmers are going to produce. A related challenge is lack of market infrastructure like pack sheds. Farmer12 has also obtained skills in protecting her tomatoes and potatoes from frost. She does this by burning cow dung around the field particularly on the wind-blowing side. The market has also modified the behaviour of Farmer 12 and other farmers who used to prefer working in isolation. Taking commodities to the market showed her that the market should stimulate production not the other way round. The market is about volume, competition and quality which is why a code of conduct is necessary.

Before visiting the market, Farmer 12 was always a price taker – depending on people who came to buy her produce to set a price. The market opened her eyes about price and other market actors. She gained the confidence to negotiate with institutional buyers like Cairns Foods from an informed position because the informal market provided a price guide. She stopped producing bigger varieties that yield more but are shunned by customers. The market also advised the farmer why she should not continue using farmer-saved seed because it has negative implications on yield and diseases. Information on preferred varieties was provided to the farmer.

The market also gave Farmer 12 a platform for price negotiation. She became empowered to understand that price is not given or dictated by either party but should result from negotiation. Rather than coming to the market with a price in their heads, farmers should develop a cost structure based on thorough records including labour. Commodity prices

should not be thumb-sucked. “If you still base your decision on price you have not started farming. You make money on volume and quality”, she said.

### 4.13 Farmer 13 - The role of fertilisers in the quality of commodities

The market showed the farmer varieties that are on the market but not available in her rural community. Farmer 13 was producing ordinary Rodate tomato variety when the market and other farmers had moved to Rodate Plus - an improved variety. The variety is now two and half years in the market but farmers in Mutasa district who sell to Sakubva market in Mutare did not know about it. Some of her fellow farmers are still producing Rio Grande, a processing tomato when there are new ones that could outperform it such as HTX14, a star range and Calistar from Pedistock. Farmer 13 also got to know about the existence of special tomato fertilizers. To increase shelf life the farmer learnt that Calcium Nitrate is good as opposed to relying on compounds like Compound D and Ammonium Nitrate (AN). The farmer also learnt to apply Potassium Nitrate which leads to good quality fruits not small. She also learnt how Muriate of Potash can increase fruit size. Potash and basal result in standard fruit size which does not do well on the market. Because of coming to the market and meeting hands-on farmers, farmer 13 got educated on agronomic practices for cabbages, onions and other crops. The farmer got to know that too much application of AN causes a phenomenon called bull necks on onion which is also a function of the seed characteristic as well as splits which are not accepted on the market.

### 4.14 Farmer 14 - The importance of fully understanding the potato

Following euphoria about producing potatoes from sacks, many farmers like farmer 14 got useful feedback from the market. The market informed Farmer 14 that potatoes grown in sacks have the following shortcomings:

- They are turgid – they have too much water in them, thus they become tasteless.
- They do not cook to a soft texture.
- They are pale in colour as compared to the ones grown in the ground.
- Naturally potatoes grown in the ground stick together after being cut because of the juices that they have. Those produced from sacks did not stick together because of their turgidity.

The mistake suffered by Farmer 14 through producing potatoes in sacks enabled him to learn the following important things about potato production:

- The number of tubers produced by each plant and maximum weight per tuber is influenced by agronomic and varietal potential. The more the number of tubers the smaller they become. Each potato variety has a yield potential which is determined by nature and cannot be economically controlled. Even if crop management and fertilizer application is increased, yield will not go beyond the yield potential. In Zimbabwe a commonly grown variety is *BP 1* with a yield potential of less than 2 kilogrammes per plant. Promoters of sack potato production were claiming a potential yield of 15 kilogrammes per plant. It was not possible to go beyond the potential yield potential even if you grow the variety in sacks.
- Half the number of potato tubers is formed at the first node (node at the base) and the other half is formed at the next five nodes. Even if the sacks were filled the potatoes will not form tubers beyond the first 6 nodes.
- Potatoes reach maturity between 70- 100 days after emergence depending on the variety. Even if you continue filling the sack and watering after this time the potato may remain green but it will not continue to produce any tubers.
- Low nitrogen and high sucrose levels in the potato plant favours the formation of tubers. High fertilizer rates were applied in sacks and some farmers even applied compound D which has higher nitrogen content and its use is not recommended in all the roots and tuber crops. Compound D which, together with the high rates of AN, were applied favours vegetative growth at the expense of tuber development.
- Potato root growth occurs when soil temperatures are between 10 to 35˚C. The most active root development is at soil temperatures of between 15 and 20˚C. The optimum soil temperature for tuber initiation is 15 to 20˚C. The sacks used in sack potato production were made of polythene material and some are lined with plastic. There is a possibility that they caused increased temperatures which slowed down the initiation of tuber formation.
- The ideal potato soils are well-structured with good drainage allowing proper root aeration and tuber development with minimum disease infestation. The sack disturbed the drainage hence the aeration of the roots.
- More vigilance should be exercised when watering potatoes. The soil should not be wet but damp and there should be uniform moisture in the soil. It is very difficult to have uniform moisture in the sack. The difference in moisture can affect the cooling

of the soil resulting in the promotion of knobs which are caused by secondary growth. Potatoes grown in sacks had deformed shapes resulting in poor quality and affecting marketability.

### 4.15 Farmer 15 – How tomatoes and potatoes can heal the soil

According to Farmer 15, a potato farmer she met Mbare market in Harare gave her important tricks in potato production. The crop should be grown with great management practices. Fertiliser should be mixed with soil first rather than applying to the plant directly. Experience is far more important than training to avoid situations where the bottom part of the potato fails to yield. The nitty-gritty is far more important (land preparation, plant spacing, fertiliser application, soil testing, fungicides, distribution of fertiliser in the sack, methods of irrigation and timing). The physiology of the potato is such that as long as the plant is in darkness it develops roots. Light causes emergence of branches. You need four plantings to be proficient in potato production. As a farmer you also need a mentor and be able to monitor, take notes and compare. You can't do this through training alone.

The market enabled Farmer 15 to learn from other farmers how they use horticulture crops like tomatoes and potatoes to heal the soil for generations. By restoring soils, farmers are substantially contributing to mitigating climate change. Farmer 15 is now aware of diverse nutrients not just Nitrogen, Phosphorus and Potassium (N.P.K) to which the majority of farmers have become accustomed. Growing potatoes and tomatoes have increased farmer 15's soil's water-holding capacity while reducing water logging. She now knows that the resilience of farms and farming is closely tied to the state of the soil. Through horticulture, farmer 15 thinks soil reclamation is receiving the attention it deserves. A key part of the soil restoration process involves using a diversity of plants.

### 4.16 Farmer 16 – There is order in the seeming chaos of informal markets

According to Farmer 16, for many years it has been believed that retailing and wholesaling only occur in supermarkets and wholesalers where groceries are sold. Many people consider informal agricultural markets as chaotic places characterized by disorder[38]. However, there is order in the seeming chaos, according to Farmer 16. Traders in the market are able to balance

[38] As a Complex Adaptive System, there is order in what people see as disorder in informal agricultural markets. Some of the insights on Complex Adaptive Systems as sources of knowledge can be found in AARTS N, LEEUWIS C, LIGTHENBERG A, VAN PAASEN A. 2012. Discourse dynamics and the emergence of innovation in Complex Adaptive Systems. *The Global Science Gateway*

the demands of both wholesalers and retailers by collecting an assortment of produce from different farmers and buying in large quantities and selling to consumers in small units. By so doing traders add value to produce sold to consumers. Consumers are able to choose from a wide range of produce in various sizes and standards. Farmer 16 and other farmers are realizing that consumers are now more discerning so much that standards and grading are becoming very important in the market. Since they are at the centre of market transactions where they listen to demands from farmers and final consumers, traders tend to set the rules of the marketing game. For this to happen, feedback from consumers (demand) and supply (farmers) is always important. However, most farmers particularly those who do not often visit the market have no clue of grades and standards prevailing on the market. Lack of adequate market information, including on grading and standardisation, diminish the ability of farmers to make informed decisions. Grades and standards are defined parameters that segregate similar products into categories that are described with consistent terminology commonly understood by market participants. In the market, tomato varieties like jam tomatoes are most preferred compared to money-makers due to the fact that they have a constant size and have a longer shelf life compared to the round tomatoes. A box of tomatoes should contain tomatoes of the same general characteristics i.e. should be of the same firmness and shade of colour, shape, for example Jam tomatoes should not be mixed with the Mooney maker variety. Superior grade tomatoes should be mature and have reached the stage of proper completion of the ripening process. The shape should be typical of that variety i.e. if they are money makers they are supposed to be round clean-free from any foreign material such as dirt well coloured. Highest quality are superior, Grade B and the least are of economy grade.

### 4.17 Farmer 17 – Balancing farmers' learning habits and absorption capacity

One of the major lessons from the informal market for farmers like Farmer 17 is that careful and patient use of inputs can result in better outcomes for potato producers. Farmers who have become successful in both potato and tomato production have done so due to small, incremental changes. Farmers' information absorptive capacity determines how they learn[39].

[39] The way farmers learn resonates with ideas expressed in ANDERSON, L. W., KRATHWOHL, D. R., AIRASIAN, P. W., CRUIKSHANK, K. A., MAYER, R. E., PINTRICH, P. R., RATHS, J., WITTROCK, M. C. 2000. *A Taxonomy for Learning, Teaching, and Assessing: A revision of Bloom's Taxonomy of Educational Objectives*. New York: Pearson, Allyn & Bacon.

Otherwise, too much information will not lead to learning. According to Farmer 17, agriculture extension officers put more emphasis on what farmers do not know and need to know rather than what they already know and practice which constitute their strengths. On the other hand, formal agriculture colleges focus too much on content dissemination. As a result, such institutions have failed to foster the love of learning since they do not motivate farmers to learn for themselves. One problem is the continuing focus on subject-based curricula which separate education from reality. As proven by the informal agriculture markets, farmers and traders do not practice farming or trading in subject areas.

Through the informal agriculture market, farmers have better access to information and to more people than extension officers. In some field days or agriculture shows, while extension officers are explaining things to farmers, the farmers can be chatting through their mobile phones with other farmers in the market in real time. In this case, the most correct and current information will be that farmers are receiving through mobile phones than what the extension officer will be getting from a book. Individual and peer-to-peer learning is a key part of promoting learning through the informal agriculture market. Although in complex systems like informal agriculture markets, solutions are never simple, farmers and traders learn better and faster – individually and as a community. Through the market, farmers share information, inspiration, solutions and aspirations. Success in potato farming or trading is less about natural talent but focus, practice and passion.

### 4.18 Farmer 18 – The role of human senses in the market

The informal agriculture market has made Farmer 18 and other farmers aware of how human senses like taste, smell, touch and sight influence market performance. According to farmer 18, in the informal market, taste is closely related to trust. Farmers, traders and consumers trust food that tastes good to be more nutritious than bitter or smelly food. Carrot is one of the crops where taste is used to figure out sugars. Most carrots sold during the rainy season are flat due to too much water. Through the market, farmers become aware that flatness is a result of not being subjected to the right irrigation and sunlight. Towards maturity, carrots are supposed to be denied water to promote sugar formation and taste. Too much water affects taste. Farmers who have learnt this in the market have gone home and corrected their farming practices. The sense of taste is also used in oranges and naartjies. All informal markets now allow consumers to taste oranges and naartjies as a way of luring them. A sense of touch is critical in tomatoes. In fact, touch is a second determinant of price and quality. During production, calcium nitrate is applied to tomatoes to make them firm and have a

longer shelf life. Consumers touch tomatoes to feel the firmness before deciding to buy. Firm tomatoes often command a high price. This is important for farmers to know before bringing tomatoes to the market.

For butternut, the sense of sight is mostly used. Visual appearance and colour are key determinants. A high quality butternut should have a golden brown colour. However the colour differs from red soils and sandy soils. Those from sandy soils are light brown while red soils produce brownish butternuts which tend to be preferred by most consumers. Consumers who are not fussy about colour end up buying for price. Butternuts from red soils tend to fetch more. Soils also influence potatoes the same way. Potatoes from sandy soils are whitish while those from red soils are brown. Butternuts and potatoes take the colour of the medium through which they are grown. If you grow potatoes on black soil, they become whitish because they fail to take the black colour. Black soils do not influence the colour of produce. Thus the potatoes become white which is an easier colour to pick. By merely looking at the colour of the produce, smart consumers can tell the soils in which they were grown.

Visual appearance is also very important for butternuts. Consumers can tell that butternut is immature by looking at the green lines that are located at the end where the fruit is linked to the stem. If these green lines are longer, it shows the butternuts have been harvested ahead of their maturity time. Some consumers can buy these butternuts and store for about a month after which the butternuts taste much better since the sugars will have found time to form. Visual appearance is, therefore, a key quality factor and a determinant of consumers' purchasing behaviour. A butternut can be kept off plant for up to six months without getting bad and consequently producing a superior taste. Other consumers add salt or sugar to improve flavour.

A sense of touch is also prevalent in potatoes where firmness represents good quality as opposed to softness. Touching is a way of sampling. When the potatoes are too soft, they are getting bad. A sense of touch also works in cucumbers with firmness showing a good quality. Firm tomatoes can be kept off-fridge for up to 30 days, particularly good hybrid varieties like Royal Plus,Nemoneta, Daniella, Star 9009. Coincidentally, some consumers say tomatoes taste better when kept off-fridge. Once in the fridge, you can't use the tomato for sandwiches. Traditional farmers are now getting to know the lifestyles of consumers who buy their products, thanks to the informal market. Selling to parastatals or export companies does not afford farmers to hear from people who buy their products.

Some customers use their sense of taste for lettuce to detect bitterness which may be due to over-fertilization with AN and less irrigation. You do not want to hear your visitors or invited guests telling you that your sandwiches taste bitter. Cabbages are basically measured through touch, seeing and sound. Consumers touch the cabbage and beat it with their palms to hear any sound that shows a hollow internal. If the cabbage is hollow it makes a peculiar drumming sound. Consumers also touch to check head firmness. Purplish leaves on the head also indicate poor quality which may be due to: (a) early harvesting before full maturity; (b) lack of fertilizer at head formation, particularly nitrogen. If cabbage lacks phosphorus it becomes purplish in colour especially the leaves on the head. This also shows lack of micronutrients.

In formal markets like supermarkets you do not get permission to taste carrots or lettuce before buying. However, besides being exposed to a wide range of volumes and sizes, the informal market allows you to touch and use many of your human senses. The informal market has diverse units of measurement, pack sizes and you get a free paper-bag. There is more customer care in the informal market than in formal markets where you are left to roam the super market and make your own bad decisions. Supermarkets assume every customer knows what s/he wants. In formal shops you get greenhouse tomatoes while in informal markets you get jam tomatoes, open field (round tomatoes) and green house tomatoes. It is now common to see cucumbers and mangoes sliced for tasting by consumers. The informal market is now also slicing carrots, peas and other vegetables which are mixed and sold as a package, the way supermarkets do it.

As a supplier, the formal market is completely unfriendly because it takes the top grade and rejects the rest. Yet in farming there is no way a farmer can produce the same top grade at the same time. Tomatoes or potatoes do not produce the same fruit as if manufactured through a machine. Hence the need for informal markets where there is diversity according to income levels and other considerations. Since the export market has no room for ‘inferior’ produce, most potatoes and peas are rejected but end up in the informal market where a farmer will at least get something. The informal market takes everybody on board and is thus really inclusive as opposed to those who encourage crops which only a few people will buy with the rest rejected.

Tasting as an indicator is also prevalent in apples, peaches and pineapples. Tasting is for bitterness which speaks to agronomic practices. Some traders actually give you fruits to taste. If not mature, the taste of some fruits like oranges is sour. Bitterness is a negative

thing and reflects lack of appropriate materials, inadequate water supply and timing of the water supply. Too much water towards maturity disturbs the formation of sugars in carrots. With many supermarket and other formal markets now getting produce from the informal market, it means standards and quality control used in the formal market are set in the informal market. In the formal market, commodities are pre-weighed and packaged irrespective of taste. In the informal market consumers have an opportunity to touch, taste and grade according to their preferences.

### 4.19 Farmer 19 - How the informal market is a rapid response system

"As a farmer I previously had problems in dealing with both external and internal factors that affect agriculture. This is one area where the informal market has assisted me by providing a rapid response system. While weather reports are important at a general level, when rain falls, I need real time advice based on the amount of moisture in my particular clay loamy soils. Some of my challenges have included estimating the amount of rainfall or moisture in the soils, how long to wait before planting, time taken by crops to germinate and planting depth depending on specific amounts of moisture. These issues can only be addressed through localised context – specific advice as soon as rain touches the ground. Rainfall is an external factor on which every farmer needs assistance so that s/he can accurately manipulate it. Through the market I learnt how other farmers manipulate moisture in their soils.

The informal market has become a rapid response system which provides information and knowledge on demand projections. Very few farmers know what is required by a particular market in the next two to three months in terms of volumes, varieties and probable prices as well as location. I get most of the useful information from the people's market where the majority of consumers buy commodities. Farmers who do not visit informal agriculture markets rely on ad hoc information and rumours. This reduces their ability to match production with supply in terms of yield, varieties and volumes. In most cases these farmers lose out because there is no demand during gluts. They also get low value for their commodities thus worsening their production capacity. All this leads to a reduction in our capacity to continue producing as farmers. It also affects other value chain actors such as equipment suppliers, input providers – thus threatening food security. The market made me aware that agriculture information should not just be about prices because prices without volume and variety of commodities are just one piece of the puzzle. Price is less significant because it comes and goes but volume can give you a complete story. All these issues illustrate the importance of clearly understanding agriculture as an ecosystem. Taking

farming as a rapid response system is critical because demand is usually triggered somewhere. For instance, more than 5000 households may want to eat potatoes from Mbare tomorrow but this demand may not be known by farmers at the moment. This means more than 30 tons of potatoes are needed tomorrow. Ten farmers can supply potatoes for 1000 households but the farmers may not be aware of this information due to lack of coordination. From visiting Mbare Market in Harare, I learnt that markets in Masvingo, Bulawayo, Bindura, Kwekwe, Gweru and Gokwe all communicate with Mbare. Farmers need to know what these markets are communicating about before planting potatoes or tomatoes.

### 4.20 Farmer 20 – How the market brings structure to unstructured information

Meeting other farmers in the market made me realize the extent to which rainfall patterns vary from one place to the other and how this affects the availability of potatoes, tomatoes and other commodities in the market. The fact that one community can receive better rainfall than another made me realize that climate change is a local phenomenon which should not be generalized at national level without robust grassroots information. The market also taught me that I should participate in national crop and livestock assessments as a way of coping with contextual issues like climate change. The crop assessment should not focus on dissemination but generating detailed knowledge that can be used from grassroots to national levels. The informal market has become major source of knowledge through diversity of ideas, openness and building farmers' ability to make sense of what is going on.

Most of the information we need as farmers becomes available in unstructured fragments but the market enables a cohesive conversation. The concept of learning a body of knowledge in a formal, structured way and then going into the workplace and applying that knowledge is not relevant to informal agriculture markets. What you learn today may be out-of-date, or disproved and wrong, next week. It is not only information and content that is changing at an increasingly rapid rate. The informal market involves the provision of a wide range of learning experiences and continuous hands-on practice. Learning solutions are no longer simple one-channel activities but market-based learning has become an integral component of knowledge sharing. The market fosters community-based learning as well as informal on-demand learning. Through the market, farmers are enabled to work smarter by focusing on context as much as they focus on content. Very little is learned or retained without context and the best learning environment is the same context where the learning is used.

### 4.21 Farmer 21 – Using information in responding to a changing climate

According to Farmer 21, seed companies should go back to the laboratory and re-design their seed genetics for resilience to moisture stress and problems such as flooding which require a crop that can stand firm. Ability to withstand flooding will be a key production parameter in low lying areas like Muzarabani and the Zambezi Valley. Other important parameters are quick germination under low moisture levels. Seed must force itself to germinate with little moisture. Germination determines plant population and yield. As farmers, we do our own experiments. Some of the farmers keep this information to themselves and use it privately to make decisions. This information feeds into collective learning. The market has taught me the importance of taking control of my learning as a farmer and work in order to be unique and creative. In the market, there is a lot to learn from each other.

### 4.22 Farmer 22 – The importance of information about rainfall and underground water

The informal agriculture market has its own powerful and quiet media based on word of mouth. This is how information on climate change and other issues is shared. For the majority of farmers like me, the climate has always been changing. Often it is more a local problem that comes in cycles of less rainfall interspersed with many good years in between. There are some important knowledge gaps among farmers. For instance, there is not knowledge comparing rainfall with groundwater fluctuations and dams in our hydrogeological basins. As a result there is no good picture of what goes on in terms of recharge and discharge country-wide. This information is very important for planning our horticulture production, livestock rearing and water management. We should be having information and knowledge on rainfall versus ground water and dams across Zimbabwe's agro-ecological zones. Such information will empower farmers to use water wisely. With rainfall becoming increasingly scattered due to a changing climate (one village may have more rainfall than it needs while a neighbouring village receives a few drops). That is why communities should be made firmly aware of their water situation. They also want to learn more about their local water resources.

With capacity building, the quality of record keeping and data collection by communities and schools can be as good as that done by observers and researchers. The practice can allow communities and farmers to see hydrology in action and we can then use the data to improve water management. While monitoring of rainfall can demonstrate the level of variability occurring from one year to the other, nothing is known about monitoring groundwater for instance monitoring the drying of shallow wells which can explain a great deal. The

monitoring of groundwater can show the extent to which groundwater levels respond to rainfall, natural discharge and changes in land use. Sometimes there is localised depletion resulting from increased use of motorised pumping for irrigation. The ability of our aquifers to deliver the necessary quantities of water in various communities is not known yet all this should be part of localised knowledge held at community level.

### 4.23 Farmer 23 – The market as a source of comparative knowledge

Through the market I have learnt that the potato needs more water than all horticulture commodities because it requires a lot of water for absorbing nutrients. It takes the most fertilizer than tomatoes. Where you use one ton of fertilizer for tomato, the potato requires one and half tons. The higher the nutrients used the more water required. Tomatoes use less nutrients and hence less water. The general trend is that all tubers need a lot of water for nutrient conversion. Tomatoes and fruits tend to need less water because they are drought-tolerant by nature. While a tomato can be denied water from 10 to 14 days you can't do the same with potato which has to be irrigated at least twice a week.

I have also learnt a lot on water use as a management practice. A farmer with enough water brings a crop that is well nourished to the market and of better quality. Water is a critical determinant of quality and yield. In the market, it is easy to see leafy vegetables or cabbages that have been starved of water. Those exposed to enough water are dark green although nutrients also contribute to colour. A smart consumer can tell the difference and make a choice. For tomatoes, an unhealthy skin and poor quality indicate lack of water. For potatoes enough water is seen through a fresh and smooth skin colour. Potatoes starved of water have a dry and rough skin. Farmers share all this knowledge in the market. I once planted *BP1* potato variety from South Africa but did not produce a good crop because I had been misinformed by the company which had supplied me with a rain gun for irrigation. The supplier had said the rain gun can supply 30ml of water per hour yet it only supplied 8 ml. As a result by using this rain gun, I starved my potato of water, producing small fruits and poor quality tubers. A fellow farmer in the market identified the problem by merely looking at my potatoes when I brought them into the market. He advised me to provide 32 – 40 ml of water in each irrigation cycle for good tuber formation, growth and size. If I had not gone to the market I would have continued doing the wrong thing. Inappropriate irrigation affects potato production.

I have also learnt that water is the constant nutrient convertor, and at flowering the potato needs more water than at germination. In a changing climate, water is going to become the

critical success factor whether you have fertilizer, manure or compost. Where water is available, farmers will have to harvest and store it carefully. It calls for a new approach in irrigation practices with drip irrigation becoming more popular at the expense of flood irrigation. Irrigation times are going to matter, for instance, when a farmer should irrigate so that moisture uptake is maximized and reduce evaporation. Seasons are becoming unpredictable such that water reservoirs will have to be properly quantified and determine how water will be shared. Visiting the market creates awareness in terms of how some farmers are privileged in terms of water availability.

The market has also made me aware of the extent to which hydrology knowledge is missing among farmers. The majority of farmers know something about measuring rainfall using a rain gauge but do not know anything about measuring underground water which is more important for horticulture given that rain seasons are going to be short. While some areas may not have dams, they have lots of underground water but farmers and rural communities may not know all this. Raising such awareness is going to be an important knowledge pathway. Technicians can teach communities to estimate the depth of their water tables.

There is often a conflict between farmers and companies which drill boreholes with companies insisting the borehole should be 40 metres mostly because their equipment is able to drill only up to 40 metres. At the moment, the District Development Fund (DDF) and a company known as Dore &Pitt are the only organisations able to drill up to 75 metres. Most small companies cannot go beyond 40 metres. This knowledge gap needs to be closed because farmers pay for borehole drilling. A drilling company can say the water table is 40 metres when it is only 18 metres but due to lack of knowledge, farmers can lose out.

### 4.24 Farmer 24 – Exposure to new technologies through the market

If I had not visited the market I would not have known that many hybrids are trying to replace Open Pollinated Varieties (OPVs) in horticulture. There are now hybrids in onion, tomato, cabbage and peppers. In potatoes, hybrids are in the form of improved varieties like Mondial which are replacing BP1, Amatheist and Jaspar, among others. When growing BP1 a very good farmer can only afford 40 tons per hectare no matter how much fertilizer or any other inputs are applied. On the other hand, farmers who are planting Mondial are cloaking 65 -80 tons per hectare. Through the market I also gathered from other farmers that greenhouse technology and drip irrigation technology has become ubiquitous. Irrigation pumps and pipes are now found almost everywhere. The rain gun has also transformed irrigation, replacing traditional sprinklers. Small engines that run on petrol and diesel are now available in many

hard wares with numerous companies now advertising their capacity to drill boreholes. All this means farmers can now draw water from any source any time. This has increased capacity of producers while reducing management/supervision time.

The market has also made me aware that horticulture has almost overtaken tobacco in terms of knowledge intensiveness. Tobacco is becoming relatively easy to produce than horticulture because it has a standard approach which is not the case with horticulture crops. Much tobacco production knowledge has been codified and institutionalised into a few rules that farmers can easily master. On the other hand, horticulture production in Chegutu is very different from Macheke because of different locations. Conversely, tobacco is generally grown in same soils, weather conditions and same time of the year while tomatoes can be grown all weather – rainy season; winter and autumn. Practices are also different by area. It takes two to three cycles of producing a particular horticulture crop like potato for a farmer to master it properly. One has to go through summer; winter and autumn production cycles to master the requirements of potato production. Winter production tends to be different from summer. In summer a farmer grapples with diseases and weed control because weeds will be germinating continuously. In winter the farmer has to contend with cold and frost.

Through the informal agriculture market, I have also learnt that although hybrids seem to be gaining ground, there is still a market for Open Pollinated Varieties (OPVs) whose favourable attributes include taste and size. While hybrid tomatoes can be good for sandwiches, OPVs like Rodate tomato will always be part of the market. According to consumers I met in the market, Rodate tomato still produces the best soup. There are also areas where hybrids do not grow well. Some very big cabbage varieties are shunned by super markets and customers. While hybrids tend to be topical, low yielding varieties still have their own areas and niches. In addition, the informal market now reflects a true natural ecosystem where big players co-exist with small players. Just as there is no country where everyone drives a Mercedes Benz, there is always space for the Mazda 323s, Uno and even motor cycles. The market behaves in the same manner. Some consumers are resisting hybrids. While Mondial potato variety produces extra - large and large potatoes, the informal market has shown a preference for small potatoes and charts which can be easily heaped into a pile when selling and can be easily measured for cooking. On the other hand, the quantity of horticulture commodities continues to exceed demand because there has not been enough effort on clearly understanding the market. Going forward, the domestic market may be left to smallholder

farmers in low potential areas who often grapple with challenges like unavailable of transport on time.

Farmers I have met in the market have also taught me that horticulture is more about regulating moisture content when producing potatoes and other crops. That is why horticulture is difficult to do in summer since most of us smallholder farmers are not able to regulate rainfall. Regulating moisture content contributes to high yields and high quality products. I have also learnt that while rain water triggers weeds as well as pests and diseases which affect potatoes and other crops, one of the major positive attributes of rain water is that it has a high nutrient content and promotes faster growth as compared to ground and surface water. Production of horticulture crops like potatoes and tomatoes goes down in summer because farmers do not have control over the time and rainfall patterns, making it difficult for them to manage crop productivity and quality. Horticulture crops that can be produced in the rainy season include cabbages, butternuts and pumpkins. On the other hand, those that cannot be produced during the rainy season include: leafy vegetables, tomatoes, onions, carrots, peas, potatoes and cucumbers. Since production of most horticultural crops is reduced by almost half during the rainy season, I have learnt to take advantage of the dry season and plant more potatoes and tomatoes. This enables me to capitalize on high output levels during autumn, winter and spring. Like other potato farmers, I now increase production during the dry season and stop producing during the rainy season.

# *Chapter 5*

# The Voice of the Traders

The qualitative research methodology involving interviews, observation and focus group discussions generated diverse insights that form this chapter. Each interview started with greetings and introductions. The researcher then explained the purpose of the interview and how the gathered information would be used. From the introduction, the researcher was able to gain the interest and cooperation of the respondents without biasing the respondents' answers. The researcher emphasized the fact that the interview results would remain confidential (in the sense that the name of the informant will not be associated with answers collected). Traders were asked knowledge practice questions and comparative questions. The set of interview questions for both farmers and traders is shown in Chapter 2 on Scope of Work and Methodology.

## 5.1 Trader 1 – How information in the market enables planning

The market has made traders aware of farmers' production plans, thus equipping traders like trader 1 with the knowledge to diversify their business portfolio in line with supply of tomatoes from farmers. Trader 1 has learnt that tomatoes planted in Oct-November are reduced in quantities due to too much summer rainfall. Farmers who supply end of December, January and up to May have equipment and materials for trellising. These farmers also plant tomatoes and potatoes in diverse soils ranging from sandy to red clay. While sandy soils drench well, trellising enables tomatoes to stand upright. The market gave Trader 1 contact details and location of farmers who produce good quality product consistently. This knowledge is critical for business planning and relationship-building. Before going to the market, he used to import commodities for sale from South Africa but the

market showed the trader that local farmers could also produce high quality product more cheaply if given the necessary support.

### 5.2 Trader 2 – The market as a source of practical wisdom for decision making

Trader 2 is a tomato and potato trader in the BUTA market of Bulawayo. She has chosen trading these commodities because small sums of money are required to start the business than chicken rearing and clothes vending. Her main challenges include the scarcity of products due to seasonal changes as well as drought. Transport is another challenge. As a result of these challenges, the trader has gained practical knowledge[40] in making difficult business decisions and this enables her to navigate challenges by creating strong relationships with other traders and farmers. Sometimes the trader is stuck with commodities after buying from many farmers and a glut suddenly happening. She has learnt a lot from how farmers succeed, both in spite of and because of difficulties like drought. She now measures her success by how many gluts and uncomfortable market circumstances she passes through.

### 5.3 Trader 3 – How a trader can almost become an agronomist

Dealing with several farmers has enabled Trader 3 to become almost like an agronomist able to advise farmers on varieties, time of planting and the best time for delivering to the market. Because many seed distributors are concentrated in Harare, farmers who stay in Mutare and other remote areas and do not visit the market often enough cannot tell when things have changed or which varieties have been phased out on the basis of poor market performance. However, demand drives the distribution of varieties as well as climatic issues like rainfall patterns. As a result, stockists have to be educated so that they can explain to farmers the characteristics and performance of the seed they stock. Some of the information trader 3 passes on to farmers include the fact that due to continuous breeding and competition between seed houses, a variety's life span can only be 5 to 10 years. For example, there is now a new tomato Star range which is replacing 3311 which was being out-performed by competitors on fruits size. A certain level of education is needed to appreciate horticulture, particularly hybrids. Open Pollinated Varieties (OPVs) like Rodate can continue growing for years but the yield is low. However an improved OPV called Rodate Plus is now available as

[40] There is an element of intuitive learning expounded by BERGER, P., LUCKMANN, T. 1971. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, Penguin, Harmondsworth

well as an intermediate variety which is more like a hybrid which can grow for up to 8 metres.

Although changes are in yield and disease tolerance, there is no big learning curve on agronomic aspects because they mostly remain the same. Innovation and competition between seed houses actually works in favour of the farmer as it contributes to improved seed quality standards. However, lay farmers can be confused by too many varieties vying for supremacy. This affects brand loyalty, for example from Star varieties to Megaton which costs two cents per grain but does well on the market. Farmers should continuously monitor seed markets for varieties that are coming in and being phased out. That is why trader/mentors like Trader 3 become very important because they do not provide biased information as would be expected from a seed house's Marketing and Public Relations Department.

Trader 3 also informs farmers of the emerging problem related to repackaging of seed and chemicals. Chemicals and seed used to be sold in packages that could identify the original supplier, e.g., Sygenta. The introduction of generic products repackaging has exposed farmers to adulterated seed and chemicals that are sub-standard. Potato and tomato seed varieties should continue coming in their brands, for example, Stark Aryires. Many distributors are currently buying in bulk for re-packaging and selling under their brands.

Farmers and traders learn faster by working together. While the modern world promotes individualism, farmers and traders thrive on collective inter-dependence. Collaboration and interdependence are salient values among informal traders and farmers. In the informal market, knowledge is built and shared through inter-generational dialogue and consensus building. This is how knowledge becomes an inclusive resource, according to trader 3.

### 5.4 Trader 4 – How ICTs accelerate the marketing pace

By stimulating informed demand for information, the market has taught trader 4 to re-arrange her priorities. From talking to everyone, she has now started networking quietly. This is helping her to manage the costs of using her mobile phone from US$20 per week to US$10 per week since she now focuses on important business inquiries than just seeking information aimlessly. She is now engaged in less talk but more action and reflection. Using mobile phones is no longer at the core of her daily activities. This follows a realization that Information and Communication Technologies (ICTs) like mobile phones are accelerating the pace at which informal agriculture markets churn out more information faster than a trader or

farmer can digest and still remain focussed. From the market, the trader has also learnt that some consumers are put off by the auction system under which most commodities like tomatoes are traded. Some customers prefer being given a price than negotiating a price with a trader or a farmer.

### 5.5 Trader 5 – How the market enables comparisons of contracts

The informal market enabled Trader 5 to see the shortcomings of contract farming in relation to tomato and potato trading. First of all contracting farming and selling distorts the market in favour of contractors and big buyers. Contract farming does not give an option to other market forces resulting in undervaluing of the commodity, in most cases. Where it was supposed to fetch a better price on the open market, the commodity value is locked within the contract agreements for a period of a year. It would make sense if farmers had the lee-way to sell at least 49% of the commodity. Commodity value is supposed to be determined by a number of factors such as:

(1) Commodity characteristics (quality, size, variety, taste and quantity, etc.,) which create space for competition with other commodities outside contract arrangements.

(2) Supply and demand of the same commodity at a given market.

Under contract arrangements, there is no room for the contracted product to compete with others even if circumstances change as often happens in the informal market. Determination of the final price is left to the contractor and so is grading. In most cases, the prices are sticking upwards which is abnormal in the way the market should function. It is normal that in setting prices, the contractor is pessimistic about the future as he is going to sell to other buyers. And on the other hand, the producer is optimistic about the future. All this is ruled out in the contract agreement which sets a sealing for ambition. Some of the consequences are more of prescription from the contractor to the farmer so much that the farmer absorbs what is given. In the event of uncertainties like drought the farmer is a loser since s/he is expected to meet contractual agreements such as repayments of inputs. Lack of flexibility in contract arrangements causes side-marketing when farmers suddenly realize that the open market pays better. An upsurge of side-marketing from contract arrangements disturbs the function of the open market.

### 5.6 Trader 6 – How the market shows the power of food

Working in the market and meeting diverse farmers has opened trader 6's eyes to the fact that food is the only thing that is common to everybody because it links directly to health. Most

farmers now see the connection between tomatoes, potatoes and health. There has been an increase in the demand for organically produced tomatoes and potatoes. The trader has realized that trading and farming are part of a bigger and complex food issue. Through the market, both farmers and traders are taking charge of their situation. While farmers are always legitimizing seed materials through planting and harvesting tomatoes and potatoes, traders legitimize trading through influencing grading and customer demands in ways formal institutions cannot do.

### 5.7 Trader 7 – The country's limitations in terms of seed

Through the market, Trader 7 has seen that low tomato and potato production has often resulted from shortage of seed and popular varieties. Most of the seed used in Zimbabwe is produced in India and Brazil with germination testing happening in Europe before the seed is shipped to Zimbabwe where it is held by seed distributors who sell to farmers on behalf of big companies who own the franchises. The major limitation for the country is that it does not produce parent seed for all major horticulture crops like potato and tomato. Government and private companies do not have the capacity to produce parent seeds. They can only produce Open Pollinated Varieties (OPVs) that are easier to produce but do not produce higher yields compared to imported hybrid seed. If we are to produce seed locally, we need cheap, disciplined labour and a quarantined environment. International seed companies which dominate the hybrid seed market are: Sygenta; Stark Aryires; Dupont and Mayford. Agents or distributors in Zimbabwe are Charter Seeds for Stark Aryires; National Tested Seeds for Mayford and Prime Seeds for Sygenta. Pedistock does Hazera and others.

Trader 7 has also seen how the liquidity crunch is determining a sustainable price for both tomatoes and potatoes. Lack of money in circulation and declining disposable income at household level has resulted in the price of tomatoes balancing out at US$2.50 - $3 per wooden box which ends up being a sustainable price for both farmers and consumers. This balances the take up rate by consumers and buyers most of whom have to buy for resale at a small profit. Low prices mean more volumes and more farmers can sell. The chain starts with consumers whose buying power sets a sealing.

### 5.8 Trader 8 –Innovation at the intersection of formal and informal markets

According to Trader 8, real innovation happens at the intersection of formal and informal agriculture markets[41]. The market has traders and farmers who are good at borrowing from both sectors and creating unique things. Informal markets like Mbare play a crucial role for many people. The informal market also enables a locally owned, alternative model of supplying affordable seed for horticulture crops. Farmers and traders wage silent battles against a lot of elements and other forces beyond their control to feed their families and villages. Adoption of modern farming technologies is part of the solution and principal among the technologies is improved seed of potatoes and tomatoes. While mechanisation, fertilisers, improved storage, and other technologies are all important in making farming more efficient, Trader 8 thought better seed is the catalyst for change — the 'software' that powers the crop and lets farmers profitably integrate other technologies. Without good seed, few other attempts to increase farmers' yields succeed or prove sustainable. Traders like Trader 8 have learnt from the market that seed is a living technology, picky about its environment and unforgiving of neglect, late delivery, or being planted in the wrong place. Since supplying improved seed is a complex business, few traders are now specializing in potato seed storage and delivery to farmers they meet in the market.

### 5.9 Trader 9 – How oral knowledge sharing is the default in the market

If documentation was the only source of knowledge, informal markets would have disappeared a long time ago, according to Trader 9. Documentation cannot account for the millions of undocumented knowledge and learning processes which occur daily in Mbare and other informal markets where oral knowledge sharing is the default. An oral and undocumented tradition seems to be so strong that it has held the whole informal market institution together for years. Millions of learning processes which have a social and economic effect occur daily but are undocumented. Traders and farmers share information without documentation and they can pick up that discourse, a day, a week, a month, a year, or even ten years later. No documentation. Lots of information exchange and transformation, none of it documented. And yet this learning goes on for decades, and is applied to various socio-economic problems without documentation.

Traders and farmers are always creating, transferring and de-constructing knowledge without documentation. The poor performance of sack potatoes on the market was not documented but knowledge was exchanged. Grading rules for different commodities have existed for

[41] Some experiences on agricultural innovations have been captured by KLERKX, L. W., LEEUWIS, C. 2008. Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. *Food Policy Journal, Vol. 33 Issue 3, 260 – 276.*

years without any documentation. Reasons for moving from 15 kg wooden crates to the current 8 – 10kg crates used in the informal market have not been documented anywhere but everyone in the informal market adheres to these unwritten rules. If every small decision and activity in the informal market was to go through a documentation process, the market would stop functioning smoothly, according to Trader 9. The informal market encourages people to talk to each other without documentation and the only subtle means of documentation is the exchange of mobile phone numbers which form each actor's growing list of contacts. What seems important is for traders, farmers and consumers is talking, engaging and conversing.

Sometimes farmers and traders release knowledge if they know who will be using it and for what purpose. Documents or manuals would not only lead to resistance in sharing information but such a process would slow down innovation that happens in the fast moving informal market. While mobile phones can assist farmers and traders in remembering who they have met for future business transactions, the informal market does not focus on the technology but how farmers and traders share, create and retain or hide information and lessons. Over the years working in the market, Trader 9 has also observed that few farmers adopt the full technological package of potato or tomato production. Several innovations and technologies have not yet reached farmers through the market. This situation necessitates the need for direct involvement of both farmers and traders in the process of innovation and technology development as well as transfer.

### 5.10 Trader 10 – How the informal market creates its own language

Trader 10 has been a trader in Mbare informal agriculture market for more than 20 years. During this period, he has learnt how the informal market creates its own language, metaphors and terminologies. The majority of farmers and traders describe the diffusion of potato and tomato seed technology and irrigation technology from the market using the word 'fluid' as a metaphor. The fast way in which new potato and tomato varieties replace old varieties is said to happen fluidly. The seed is bred in India and Brazil with germination testing happening in Europe before big companies like Syngenta channel the seed to their local distributors from which farmers obtain the seed for planting. On the other hand, farmers learn by doing because the government extension service is not equipped with sufficient horticulture extension skills. Drip irrigation kits imported from China find their way into farming communities through distributors. To the extent that potato seed, tomato seed and drip kits are modified to suit local soils and water quality, these technologies become fluid since local farmers and artisans are able to improvise and adapt to their local context.

Successful horticulture is related to the shape-changing nature of potato and tomato seed technology as well as drip technology, as these are fluidly manipulated by farmers who use them in practice. In addition, what happens in the informal agriculture market between farmers and traders as they exchange potatoes and tomatoes contributes to fluid knowledge[42] circulating in the market. Drip irrigation is considered a fluid technology and so are tomato variety and potato varieties. Although drip kits are manufactured in China and assembled in Harare, the uniformity of their shape changes once they are dispatched to rural horticulture areas like Mutoko, Mutasa, Domboshawa, Mahusekwa and Esigodini where farmers modify this technology in line with local resources and knowledge embodied in local rural artisans. The original shape of the drip technology disappears technically as it assumes a new local complexion.

Although tomato and potato seed is sold in the same packets and same shape, the shape changes when the crops are harvested and brought to the market where they are put in different crates and sandaks of different sizes depending on quality as a result of farmers' diverse crop management practices. The uniformity of seed disappears when the harvested crops show up at the market. Different farmer management practices result in different fruit shapes and sizes from the same type of seed – indicating the shape changing influence of local contexts. While some tomato seed is suitable for planting in green houses and open fields, farmers in Mutoko plant in blocks which influence the fruit outcome. Tomatoes planted in blocks do just as well if not far much better than greenhouse produced fruits.

Potato and tomato breeders who often visit farmers in traditional farming areas are often surprised by the results of what they bred. While seed uniformity disappears technically, this disappearance is confirmed by the different fruits that show up at the market. But it also disappears socially. The uniformity of tomatoes also disappears socially as individual traders in the informal market deal directly with individual farmers even if they have planted in groups. Different farmers also produce different fruit sizes even if they work in groups.

### 5.11 Trader 11 – How the market deals with multi-currencies

Since 2009 when the country stopped using the Zimbabwe dollar, the common currencies used in the market are: the United States dollar ($), the South African Rand (ZAR) and the

[42] The fluid nature of knowledge has well dealt with by BROWN, V. 2010. Multiple knowledges, multiple languages: are the limits of my language the limits of my world? *Knowledge Management for Development Journal*, 6 (2), 118–129.

Botswana Pula (BP). There is a fixed exchange rate for coins of 1:10 for US$ to Pula/Rand. However, often preferred are the US$ notes, though in a few instances traders who import produce from South Africa might accept Rand notes. Pricing for unpackaged tomatoes and potatoes in the wholesale market is mainly determined by prices charged at the farmer's market – depending on supply of produce to the farmer's market. One United States dollar (US$1) and five rand (ZAR 0.5) are normally the lowest common prices found for tomatoes, potatoes and other commodities in the market. It is rare to find produce being sold for R2, R3 or even R7. Rounding off to the nearest half a dollar or to a dollar is commonly used when the prices for produce falls in between. The standard packaging and pricing remains the same even when there is a glut of tomatoes and potatoes. When there is a shortage of tomatoes and potatoes, US$1 and ZAR are exchanged with fewer quantities of commodities to reflect high demand due to scarcity. The trading business in the informal agriculture market is more or less like gambling where some win while others lose. Usually some days are better than others and better days usually compensate for the periodic losses. Traders need to be alert all the time checking on rivals and comparing their prices and produce. In some cases, there may be need to hold produce for a day or two until the rival's runs out.

Through the informal market, traders and farmers have a new understanding of risk, according to Trader 11. Banks have traditionally paid little attention to cultivating a risk culture. However, the advent of the multicurrency regime characterised by use of US$, ZAR and Botswana Pula (BP) has seen these financial institutions over-emphasizing risk without a clear understanding of its new dynamics and pervasive nature. Most banks no longer have strong agribusiness units and this means fostering an agriculture risk culture will require the involvement of many stakeholders and value chain actors who all have different notions of risk. However, many Zimbabwean banks lack strong institutional frameworks that can promote prudent decision making from correct evaluation of risk-response scenarios. The informal agriculture market has smart ways that can enable banks to avoid and deal with Non- Performing Loans. At the moment banks do not have enough information on creditworthiness, whether in the form of reliable financial data about traders and traditional farmers, credit-bureau information, or historical performance data. Given these gaps, banks have strong incentives to work with informal agriculture traders associations in developing innovative risk models that incorporate both qualitative and quantitative factors. Currently, a credit bureau cannot adequately capture the whole credit risk particularly among farmers and informal traders. Financial institutions need new risk models that take into account social

capital which is basically the social bank for most farmers and traders who currently do not rely on banks for their business finance but quietly borrow from each other to keep their small businesses alive.

### 5.12 Trader 12 – How the market shapes and is shaped by social media

The informal agriculture market has provided a platform for intensive use of mobile phones by farmers, traders, transporters and other actors. Farmers and traders are being shaped by mobile technology as much as they are also shaping mobile technology. In order to make informed decisions, farmers and traders are exploring both the limitations and opportunities brought by social media like mobile phones. The most overwhelming is social media's reach and their ability to multiply audience figures with a previously inconceivable efficiency. However, farmers and traders are still to use social media to solve real challenges such as picking up signals of potato or tomato pests' resistance to chemicals prescribed by agro-chemical companies. Through the use of mobile phones, there are many cases where farmers' weather forecasts turn out to be more accurate than those of individual experts.

Many farmers who bring commodities to the market are taking advantage of the potency of social media to leverage influence. In the current generation of platforms, the social element is a more important driver of communication than the media one. Trust determines who you listen to and when, not the technology either of you use. Trust between traders and farmers working as a social group in the informal market is more powerful than random groups of people even if they are part of a mobile company's subscriber base. However, socio-economically responsible engagement requires some kind of organized platform such as an informal market. The informal market provides a solid strategy for delivering agriculture outcomes. Information flying around from mobile service providers and other sources represents a vast amount of data to process. Such information needs to be analysed and that needs to happen quickly because speed is crucial.

At the moment, there is no short cut available for the human filtering that allows agriculture decisions to be made accurately. Traders and farmers receive as much positive messaging as negative messaging in the form of commercially biased messages conveyed through advertisements. On a basic level, there are still some issues that present barriers to participation, such as functional literacy. Very few smallholder farmers and traders can send text messages about tomato prices or potato prices. Internet usage is still very low among farming communities and informal markets. Context is proving to be more important than scale.

### 5.13 Trader 13 – The market and personal transformation

What farmers and traders do and how they understand the informal market keeps coming back to personal initiative and personal stories. The market offers a rich conversation with traders sharing many characteristics of curiosity and uncertainty transforming into trust and confidence among peers. Each trader would have never have found these tools and processes had s/he not consciously stepped into informal agriculture markets. "Over a decade of working in Bulawayo market has caused a personal transformation that has helped to shape the outline of a professional identity that I have been filling out, amending and reflecting on with and through the learning journeys that play out across the informal market, events, and the web of relationships they create and are created by the market," said Trader 13.

As a trader I take leaps of faith which involve taking risks on the basis of inadequate data, testing the market, experimenting and being innovative. Visits to the market are absorbing and inspiring. Farmers and traders thrive on testing, failing early and often, iterating and learning from users. For farmers and traders, experimentation and learning is part of heading in the right direction. If farmers and traders were to wait until they had gathered all the correct information in order to act, there would not be an active market.

### 5.14 Trader 14 – Informal markets and digital learning

Farmers and traders in all informal markets have become immersed in technology through mobile phones. To a large extent, these actors have become digital learners. With the Zimbabwean economy becoming informal, many university graduates are joining the informal market where they fuse their digital culture with activities in the informal agriculture market. Mobile technology is becoming an integral part of social life in informal agriculture markets. Using this technology, young farmers and traders are acknowledging each other and forming personal identities. To that end, ICTs are supporting informal trading activities.

Through ICTs the informal agriculture market now has a complex set of intertwined cognitive skills. The first new dimension encompasses the evolving nature of literacy including financial literacy, which now involves not only text but also image and screen literacy. Some farmers' and traders' ability to comprehend multimedia texts and to feel comfortable with new, multimedia genres is increasing as they can now send photographs of their commodities to traders before visiting the market. This enables decisions on quality and value to be made before the commodity comes to the market – creating an on-going dialogue between farmers, traders and consumers. To a large extent, the informal market has

developed its own vernacular and language for the informal digital culture. The ability to communicate and express oneself with images, sound, and other media is a crucial aspect of the new literacy in the informal agriculture market and among farmers in field days.

Information navigation is becoming a key component of literacy[43]. Farmers and traders are constantly discovering new things as they browse through emergent digital sources of information. The mobile phone has fused learning and entertainment, creating infotainment. Through social media, learning has become situated in action. Mobile phones provide possibilities for mobile-aided analysis of data – giving farmers and traders direct experience with basic phenomena, enhancing their conceptualization and understanding of the material.

### 5.15 Trader 15 – The importance of understanding customer behaviour

Working in the Bulawayo Market for the past 10 years has made me aware of the importance of understanding the behaviour of customers who buy from the market. As a result, I have tried to establish a brand and created personal relationships with my customers so that I can satisfy them at a deeper level. Before I go to buy commodities from farms, I ask my customers what they want and I bring it as per their requirements. This means my customers have become part of the informal agriculture market. Besides assessing customer loyalty through purchasing behaviours, I have also taken time to study customers' attitudes and sensitivity to price. I have also realized that ordinary consumers have adjusted their eating habits. Diets are rapidly changing with bread losing its footing to substitutes like sweet potatoes, potatoes, butternuts, pumpkins, rice and tomato stew as well as boiled sugar beans, cow peas and roundnuts all mixed with maize to produce *mutakura* in Shona or *Inkobe* in Isindebele. In urban areas where urban farming has spread like wildfire, consumers are now producing their own bread substitutes mainly sweet potatoes.

Economic hardships are also prompting many households to think creatively about how to save the elusive US$. Every household tries to be conscious of the cost of a US$. Some of the key questions on consumers' minds include: *How much of a household's US$ can buy a five litre bucket of sweet potatoes which can feed a family of six for the greater part of the day?* Three cups of rice for a US$ can feed a family of six for half a day. For many households, a dollar should take a family of six from breakfast to lunch whereas a loaf of

[43] ICTs are becoming an integral part of people's identities as explained by CASTELLS, M. 2004. *The power of identity. The information age: economy, society and culture Vol. II.* Blackwell, Cambridge.

bread that costs $1 cannot take a family of six for half a day. Resorting to bread also attracts other additives like margarine and jam costing at least $2 over and above the $1 for a loaf. In most households, a loaf of bread is now for children going to school with other members of the household depending on various substitutes for breakfast. All these dynamics impact the performance of potatoes and tomatoes on the market because these commodities have suddenly become competitors in the food basket. Understanding the whole food basket has become very important for both farmers and traders.

Some of my customers are not worried about price as long as the potato is of good quality. As a trader, I learnt to foster a customer-centric culture toward protecting long-term interests and profitability. Every trader now ensures bad behaviour is not allowed in the market. This collective behaviour by traders enable the informal market to thrive without commercial advertising the way super markets and other commercial food companies do. By doing the right thing to customers, each trader and farmer takes care of advertising costs. My observation is that most formal advertisements try to be more persuasive than informative. Being informative means presenting the benefits of a potato or tomato to the customer - its characteristics and uniqueness. What we see in most formal advertisements is portrayal of products as performing wonders and this is an element of exaggeration which consumers can see through.

In informal agriculture markets, advertising is more of knowledge-sharing and learning based on farmers and traders exchanging knowledge or notes (why should I buy this potato?). The consumer comes back with feedback on how the potato tasted when cooked and this information is relayed back to the farmer by the trader. Informal markets have marketed themselves for years and that is why consumers continue coming to the market. Encounters in the market are more than just give and take but learning and relationship building. Collectively each market has its strengths and weaknesses. Strengths draw customers to the market. For instance, Mbare is known for diverse products and more volumes; Gweru is central for areas like Mberengwa, Gokwe and Lower Gweru while Bulawayo is renowned for diverse dry foods and closeness to Botswana which is another market.

The informal market is not only based on individuals attracting customers but the actors within the market have individual knowledge, skills, relationships, customer care and capabilities that build the competitive advantage of each market (e.g., Mbare). All this is often un-documented. Some of this knowledge should be documented so that actors understand the nature of competition and trends in the market.

### 5.16 Trader 16 – The significance of understanding market size

At any given time, if you walk into the Mbare Agriculture Market of Harare assessing the value of agriculture commodities, you will see diverse commodities collectively worth more than US$20 million. Assuming you are not tired and decide to do the same thing in Bulawayo, Mutare, Gweru, Kwekwe, Masvingo and Chinhoyi urban agriculture markets, you will see commodities worth a collective US$30 million. There are few, if any, agriculture companies listed on the stock exchange who hold commodities worth even a quarter of the above figures at any given time.

The true performance of agro-based economies like Zimbabwe can be seen through the informal market where the volume, variety and velocity of commodities and hard cash are more than formal markets. Mbare Agriculture Market is an institution with its own subsidiaries like corporate businesses which have branches across the country. Mbare supplies Masvingo, Mutare, Bulawayo, Kwekwe and rural markets such as Guruve or Gokwe. The market serves all income levels and all sectors of the economy including mining, manufacturing as well as processors, input suppliers, food chain stores, transporters and government institutions. It also creates post-harvest employment around activities like harvesting, grading, transportation, off-loading, marketing and repackaging for end-users. From harvesting up to when the commodity is in the hands of consumers, employment creation is tenfold. We start with two employees loading the truck and at the end of the chain 20 people will have been employed. Although this form of employment may not be formal or monthly, it is hourly everyday employment which ensures household income and sustenance. To that end, the market distributes wealth to common people, creating a real commonwealth. It is unlike the formal economy which tries to create employment for formally educated people who, in most cases, lack practical wisdom that comes from handling commodities along the value chain. Since hourly everyday employment goes un-recorded, formal institutions are under-estimating agriculture's employment potential.

Using price as an indicator gives us the potential value of the commodity. This is important for farmers so that they can consider factors like standards, trends, market information and crop calendars before coming to the market. The intrinsic (embedded) value of each agriculture commodity is important than the face value represented by price and revenue. However, gluts and cash shortages in the market tend to suppress the true value of agriculture commodities. Mbare Agriculture Market has a minimum re-order stock level. That is why at no point you find the market without agriculture commodities. Mbare Agriculture market's

minimum re-order level is commodities worth at least $5 million. In the informal market, fluctuations in prices along the agricultural value chain do not affect value chain actors the same way. If the price of tomatoes falls a restaurant benefits but does not reduce the price of a plate of *sadza* or rice. On the other hand, if the price of tomatoes goes up, the restaurant suffers but does not increase the price of a plate of *sadza* to recoup losses.

Commodities in the informal market are always in transit without a form of formal insurance. Coincidentally nothing negative happens in most of the cases. It is a purely trust and relationship based market where everybody does his or her best to make sure things function smoothly. Part of the reason why Zimbabwean agro-processing companies have collapsed is because they depended so much on the production side forgetting that a lot happens between production and the market. On-farm assessments do not often translate to correct quantities that reach the market due to post-harvest losses. Assessment of commodities on the market is a better measure of the country's capacity to sustainably drive manufacturing. This is because the people's market competes for commodities with processors. That means processors should have an interest in what happens on the market, otherwise investment in machinery and labour will remain offside if processing companies are not able to estimate consumption patterns and surplus in the informal market.

The informal market has considerable capacity to sweep commodities from all corners of the country efficiently while it will be very costly for private companies to do so. Not all commodities go into processing. There is a certain percentage that heads straight to consumers without going through commercial processing. Some commodities are either consumed raw or processed at household and small enterprise level. Agro-processing companies need to know how much is processed at household and small enterprise levels in order to accurately angle for the surplus. Due to food safety and other concerns related to the over-processing of food, many consumers now prefer household processing or small enterprise level processing where processes are manageable and fairly predictable. In addition, fewer financial resources imply potential processors now prefer small and affordable processing equipment rather than grappling with heavy duty equipment which requires tons of commodities at one go.

There should be a strong relationship between informal markets and manufacturing companies. Everyone needs to know his or her competitor. Informal markets tend to have strong relationships with producers. There are numerous cases of contractual agreements between companies and farmers going sour. In the informal market everything is clear and a

farmer can see how his or her produce is competing with that from other farmers. Because contract companies take commodities and the farmer does not see or know what is happening behind the scenes when he or she has handed over the commodity, there is always suspicion that companies are making more money. Making things transparent has numerous advantages. Informal markets like Mbare pay cash on delivery whereas companies make farmers wait for 7 to 30 days. Since farmers consider opportunity cost more than price, they would rather get less money for their commodities immediately than wait two weeks for a slightly higher price offered by a company. Usually when farmers sell there is an issue requiring immediate attention and they usually cannot wait for seven or more days. One of the most critical roles of informal markets is coordinating the distribution of food across the country. When food comes from farming areas into the market, it is not usually coordinated but the market will distribute this food to deficit areas according to demand. That is why you find pineapples produced in Chipinge end up in Bulawayo within hours. While banks still think financing agriculture should target the farmer as the main recipient of the loan, in Zimbabwe there is enough evidence showing that when traders have money, such money ends up with farmers in Mutoko, Chipinge, Murewa, Gokwe, Mhondoro, Mwenezi, Muzarabani and many other rural areas which supply commodities to the people's market.

### 5.17 Trader 17 – Balancing individual and group efforts

Individual creativity is sometimes very difficult to express in a group. A number of agriculture traders in the informal agriculture market can briefly come together as a group to buy potatoes or tomatoes in bulk. However, when it comes to selling it becomes each man for himself because different performance levels and different commodity lines present challenges to initiatives like group lending. Group collateral and repayments often constrain a trader who wants to run with the stick. Some groups are inflexible to emergencies which often crop up in many households. As a result, a group member cannot wait for two weeks to fulfil an order when s/he has a pressing issue that can be solved through selling agricultural commodities quickly.

The natural inclination for many traders like me is selling my own commodities at the individual level. Some of the questions we ask as traders include:

1. When we form groups, how do one's personal networks come into the group? There is a danger of a trader losing his/her own personal networks built over years.

2. What should come first a group or the market? The market should inform the formation of trading groups in terms of volume of commodities in demand, timing, capacity, seasonality (calendar, etc.) It is not a contract but a market that informs traders what to buy and bring to the market. Group consignments usually carry diverse expectations which the market cannot level at group but individual level. It is difficult to represent another person's commodity because some individuals think they can creatively articulate the value of their commodity better because they know it intimately.

Sometimes the market creates more personal relationships than group relationships. Individual traders and farmers create strong personal relationships through face to face interactions. Groups should focus on production for consistent supply to the market. At the moment it is common to find a whole group producing tomatoes at once and selling the produce at once. A balanced market-driven approach to production should encourage farmers to produce in a staggered manner as individuals such that the same commodity gets into the market sequentially over an extended period. In this case, it is not a group but a supply chain.

The market has a way of shifting the focus from people to commodities. The question should be how many commodities and in what volumes are agricultural commodities coming from a community not how many farmers? Agricultural markets are full of fast-moving dynamics which most groups cannot cope with such that it ultimately sometimes becomes a domain for individual creativity and flexibility. Although the market may seem disorganized, farmers, traders, consumers and other actors are connected in ways that allow them to leverage opportunities as they emerge. The quality of a group depends on the quality of individuals in the group. By empowering individuals to make sense of their context, the informal agriculture market enriches groups into which these individuals may find themselves. Individual learning is more powerful because it is demand-driven as opposed to group training which is often supply-driven and may not motivate individuals to learn for themselves.

### 5.18 Trader 18 – The market and commodity measurements

The fast rate at which transactions take place in the people's market means as a trader I have to attend to many customers at once. There is no time to measure commodities in kilogrammes in such a fast paced auction system. For potatoes, cabbages, butternuts and other commodities it can be time consuming and not practical to translate value into kilogrammes. Again, in the farmers' market, farmers and traders only have four hours to

attend to thousands of customers and that means measuring using kilogrammes is not practical. To cope with this challenge, the market (farmers, traders, vendors and ordinary consumers) has established a standard way of determining value and prices of commodities. We mainly use volume not kilogrammes, for example a cup of beans, a pocket of oranges, a crate of tomatoes, a basket of bananas, etc. In addition, most of our customers do not look for kilogrammes but volume, for example a pocket of potatoes which can be seen and related to price. Volume within a container can be seen but you cannot see kilogrammes which can be manipulated through a weighing scale.

It is also easy to adjust volume in such a way that instead of increasing price you just reduce the volume. If there is a shortage of tomatoes, where a pocket containing 10 potato tubers would go for a $1, a trader can pack eight tubers for the same price. Experience in the market shows that customers are put off by price increase but do not mind a decrease in volume/quantity for the same price. In addition, many customers (most of whom have not gone to formal schools) are not conversant with the use of kilogrammes, grams and other modern expressions of volume and value. A common language like a cup, bucket, pocket, 50kg Sasseka is used on a daily basis and makes translation very easy.

The same language is ideal for exchanging commodities through barter deals, for example, a box of tomatoes can be exchanged with a basket of bananas. It would be very difficult to do conversions of tomatoes and bananas into kilogrammes and then into monetary value partly due to different water content in each commodity. The value can more easily be expressed in volume than weight (kg). Decision-making becomes simple due to the use of the same language which also prevents transaction challenges. Where we do not have technology or equipment to measure moisture content, there is no point in complicating the market. The market has become dynamic in developing its own ability to identify and characterise commodities based on different levels of water content, colour, ripeness, taste, sweetness, etc. These skills are now used to differentiate prices (value, etc.,) in preference to using weight (kg). A kilogramme may not say much about the value of a commodity.

Resorting to the same language makes value chain transactions smooth. Since the majority of smallholder farmers do not have weighing scales, using weighing scales to determine the value of commodities in the market will create problems and dissatisfactions. Smallholder farmers also understand measurements in the informal market and by the time a farmer brings potatoes to the market, s/he will have attached a value to his/her commodity. Major customers such as vendors also do not have scales but buy commodities like tomatoes for sale

to household consumers who also buy from vendors without insisting on weighing tomatoes or potatoes they buy. Therefore, volume as a language is understood right through. Even at production level, farmers now know how many boxes (not kilogrammes) of tomatoes to expect from one plant. This expression of value is consistent with the informal market. Transporters also do not charge for their services in kilogrammes but work with boxes and kilometres. They often charge 80c/box which is around the price of a box in the market. They do not use a litre of fuel or a kg of produce which is mostly detached from the commodity.

The most satisfactory sales are conversations where you negotiate while looking at the commodity and sometimes value is determined by what the seller wants to do as well as the urgency of what needs to be done. The informal market has a way of carrying these factors along the value chain. Knowledge of how to use buckets, crates and other measurements in the market has come a long way. Baskets for bananas have become an established measurement in banana trading. If every commodity sold in the informal market was to be expressed in weight (kg), the whole market would stop functioning, leading to a lot of inefficiencies. Even those who load and off-load commodities and push-carts would have to own a scale in order to weigh commodities before offering their services. The informal market is also characterised by a lot of adaptation in terms of packaging – e.g., using used cooking oil tins, cardboard boxes and sacks that could have been thrown away. Planks that could be burnt as firewood are also fashioned into crates. Baskets are also woven from local reeds – a good example of adapting learning and use of local resources.

### 5.19 Group Discussion with Traders

To complement individual interviews, the researcher conducted three Focus Group Discussions (FGDs) with traders in Mbare (Harare), Sakubva (Mutare) and the BUTA Market (Bulawayo). Tape recordings from these group discussions are available. Below is an explanation of a FGD with 12 traders in Mbare Informal Agriculture market (Harare). The traders specialise in tomatoes and potatoes. An illuminating discussion occurred around the following questions:

1. What are traders' expectations from formal financial institutions like banks?
2. What can be done to deal with the problem of collateral?
3. Do traders require training on record keeping?
4. Are informal traders interested in working with banks?

5. What challenges do female traders face that are different from those faced by male traders?

Participants indicated they are interested in working with banks, particularly if banks can advance soft loans to boost traders' businesses. Most traders said the major stumbling block from banks is the demand for collateral in the form of property which most of the traders do not have even if their businesses are viable. All the 12 traders said they do not have title deeds while six said they have motor vehicles and household property such as refrigerators and furniture which they said banks should consider as valid collateral. Due to the demand for collateral or payslips, the participants said they end up going to micro-finance institutions which do not insist on these requirements. However, the main problem with micro-finance institutions is the prohibitive interest rates with repayment being sometimes daily or weekly.

The participants suggested that instead of asking for collateral, banks should conduct home visits to see the residential places of anyone who wants to borrow money. Banks can also visit market stalls and monitor traders' businesses to see if a trader is eligible for a loan or not. While micro-finance institutions may be more accessible than banks, they take advantage of traders' desperation for working capital in ways that keep borrowers locked in debt for much longer. Participants mentioned one formal bank which previously provided loans and ended up with many traders as its clients who were able to open bank accounts. However, the bank has since gone out of business due to the economic challenges in the country. When it worked with the traders, the bank advertised its services and had officers who moved around the market with loan application forms. In its banking halls, the bank had a counter for traders where they were served quickly so that they did not spend much time in the queue leaving their market stalls unattended. Time is a very important factor to traders and every minute wasted is business opportunity lost.

The participants said most informal traders in the market do not keep professional business records but have small notebooks where they record quantities of produce ordered and sales made daily, weekly or monthly. The traders said they were aware of the importance of record keeping, for instance records can be used as a transaction history by banks. However, many of them said, even after showing some records most banks were interested in collateral as a basis for loaning and thus discredited the records. The traders said the majority of them handle more than US$300 daily – far more than civil servants who get loans from banks on the strengths of a payslip. Participants expressed the view that banks should take time to

understand the way informal agriculture markets function in order to design appropriate loan products.

Due to the absence of banking facilities, the traders said they resort to loaning money to each other based on strong relationships built over many years of trading together in the informal market. Many of the traders have also built strong relationships with farmers who are now comfortable to leave their potatoes and tomatoes with traders for free with the trader sending money to farmers as the commodity gets sold. This arrangement keeps business flowing even in situations where traders do not have ready cash to take commodities from farmers. This 'hallo' relationship is common in Mbare, Mutare, Bulawayo, Masvingo, Gweru and other markets. Women participants said they had more challenges in accessing loans even though they were good in paying back on time. Sometimes, due to their numerous responsibilities, repayment periods from micro-finance institutions were too short for women traders who have to juggle many commodities and roles in order to survive.

# *Chapter 6*

# Knowledge and Information in Informal Markets

In this chapter we start by identifying the main trends from the field work.
Thereafter the 4 key characteristics of knowledge processes in the informal markets that were uncovered by the investigation are discussed.
Finally some policy implications will be drawn.

## 6.1 Trends from the data

This chapter has shown that the notion of informal learning is not formal versus informal learning as in A versus B. But it is an intricate relationship where farmers and traders are not afraid of science. Although they can be sceptical about science, their relationship with science is not antagonistic. They can test it and if it works they use it and if it is not working they discard it quietly and move on. The whole way the market innovates is through a process of learning.

People working in the informal economy have not just created their own livelihood but also an entirely unique knowledge system different from the formal knowledge system although overlaps are sometimes visible. The researcher expected farmers and traders to be reluctant to speak but they were quite happy to talk freely with some volunteering to be tape-recorded. In every market and farming community, farmers and traders were keen to find out about fellow

farmers and traders in other markets. This showed a desire to seek and make sense of knowledge as well as share it.

### 6.1.1 Increased capacity for effective action

In line with Nonaka's definition of knowledge as justified belief[44] that increases capacity for effective action, most of the respondents (both farmers and traders) indicated their increased effective action following exposure to the informal market. The majority of farmer respondents indicated that the informal market enabled them to figure out the full character of the market and this helped them in resource allocation[45]. The market also shows that learning does not happen in a straight line but as a collective process. It also encourages the sharing of work in progress and half-baked ideas in order to reinforce new habits. Farmers and traders know that they do not need to agree on definitions in order to share knowledge. While aware that technology is not always the answer, they know that technology is as much a mind-set as it is a collection of data. As the informal market shows, better ways of communicating involve linking the communicator to recipients with the same interests. Farmers are no longer content with news but decision-making intelligence that can't be shared through short message service or newspapers alone. The informal market also widens local knowledge pools as more farmers and traders become more confident in expressing themselves. This is leads to coordinated production as like-minded farmers seek out each other and cluster around commodities – sharing production plans as well as marketing plans.

### 6.1.2 Farmer innovation and free-wheeling creativity

The definition of knowledge as consisting of *truths and beliefs, perspectives and concepts, judgements and expectations, methodologies and know-how used to receive information and to recognize and identify; analyse, interpret, and evaluate; synthesize and decide; plan, implement, monitor, and adapt*[46], is expressed in the informal agriculture market. The informal market has enabled many of the respondents to innovate around new varieties and modern forms of fertilizer[47].

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[44] See 3.1 in Chapter 3 under Notions of Knowledge.

[45] Farmer respondent 1 received guidelines on what is required in terms of quantity – volume, turnover in aggregate terms and in individual farmer terms. Farmer respondent 2 was able to revisit his pricing model based on feedback from the market. Farmer Respondent 4 was able to avoid production based on instincts, farmer respondent 8 realized the futility of working in isolation thanks to the market while farmer respondent 19 became aware that the market functions as a rapid response system.

[46] See 3.1 in Chapter 3 under Notions of Knowledge.

[47] Farmer respondents 2 and 13 changed fertilizer based on advice from the market while farmer respondent 3 adopted new varieties, thanks to the market. Farmer respondent 12 acquired knew knowledge on protecting potatoes and tomatoes against frost.

For farmers and traders in the market, innovation is a combination of observing; questioning; experimenting and networking. Innovation is encouraged through sharing a series of half-baked ideas and constant narration of one's activities in a trusted space like the informal market. The market creates a culture of innovation through changing the daily behaviours of farmers, traders and other actors. Farmers and traders are always learning from the edges of the economy and society, where creativity is usually in higher supply. They enjoy the cognitive challenge of creatively overcoming or circumventing limitations using their memory. They ask for advice at the moment of need. However, this requires a certain level of trust based on relationships that have been built and nurtured in the market. During emergencies, the actors turn to friends and trusted colleagues with whom they have shared experiences.

Sharing complex knowledge in trusted networks such as the informal market requires active engagement as well as verbal and non-verbal communication skills. A community like the people's market can be recognized by the energy in the place, the personal commitment of the people and their collective engagement. For these actors, informal learning is a normal and natural human activity. However, since it is invisible, most farmers and traders may be unaware of their own learning. Working and thinking aloud in the market seems the best way farmers and traders share tacit knowledge which they hold unconsciously in their memory and minds.

The informal market shows that working, talking and thinking out loud are surely aids to accessing and sharing our tacit knowledge which farmers and traders do not know they hold until they tap into it when answering questions from their peers in the market. While various commodities fit in well with the various avenues for collective thinking and collaborative practice, traders and farmers have to keep their eyes searching for what is missing. Through the market, farmers and traders gather into groups to brainstorm, debate, collaborate, co-create, plan, play, tell stories, and discuss various relevant topics.

Informal agriculture markets are a different clientele that has to be profiled in order to be clearly understood not just as individual traders and farmers but as part of the whole market. Information about an individual trader is meaningless without information about the whole market in terms of size, commodities, actors, coping mechanisms, challenges and many other parameters. Farmers and traders learn more through other farmers, agriculture markets and own experimentation. Through the market learning with others has become common as

opposed to isolated learning. The market ensures farmers communicate, connect and learn from each other in a continuous stream.

As further explained in Chapter 5, the informal agriculture market is a Community of Practice (COP)[48] which thrives on informal exchanges, unnoticed knowledge sharing as well as informal facilitation by middlemen and auctioneers who are responsible for pushing knowledge exchanges along and provoking reactions from farmers, traders, consumers and other actors. The informal market shows that solutions cannot be taught but they always have to be constructed by those who have the problem. As a COP, the informal market promotes procedures and tools that allow farmers and traders to construct solutions that work for them.

Through the market, farmers and traders set the context and build consensus around emergent practices. For both farmers and traders, their tacit knowledge expressed through action is an economic resource. This is in line with the notion of knowledge explained in chapter 3. Farmers and traders have huge stocks of knowledge, such as lessons learned, practical skills and experience, stored in the form of behaviour and social norms and most of this knowledge is tacit. Embodied knowledge is also prevalent among farmers and traders. This is expressed as individual and group memory that gives farmers and traders the capacity to act through learning. Memory enables farmers and traders to act intelligently and retain some knowledge for future action. The notion of memory is further explained in Chapter 5.

### 6.1.3 Knowledge spill overs and finding people who know

For both farmers and traders, knowledge spill-overs are prevalent between people and between commodities in ways that present the market as a knowledge ecosystem[49]. Potatoes and tomatoes are spoken about in relation to other commodities in the market because the market operates as balanced nutrition basket.

As an example of knowledge spill-overs, Farmer 3 has learnt to grow tomatoes and groundnuts as companion crops. The farmer also became aware that the sugar bean affects

[48] The notion of Communities of Practice has been popularized by WENGER, E. 1998. *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.

[49] Some of the relevant ideas on how knowledge can spill over have been dealt with by KAUFFELD -MONZ, M. 2005. *Knowledge spillovers within regional networks of innovation and the contribution made by public research.* Manuscript. Queensland University of Technology.

tomatoes because tomatoes are involved in the consumption of sugar beans by consumers. The only way farmers like Farmer 3 will know how consumers are switching from sugar beans to potatoes, cabbages, peas and other commodities that are easier to cook for relish is through the informal market. For Farmer 5, the market influences production of other crops like cabbages and carrots. Knowledge and experiences gained through cabbage production spills over into the production of carrots.

The informal market also enabled Farmer 6 to see the role of wild fruits in the performance of tomatoes and other agriculture commodities in the market. There is competition for cash between commodities in the informal market, according to farmer 6. Consumers who come to the market intending to buy a box of tomatoes change their mind when they suddenly see fresh wild fruits. They often decide to split their budgets between tomatoes and *masawu,* for instance. This means the consumer will spend slightly less on tomatoes in order to accommodate *masawu.* The implication of this is that a farmer has to also monitor trends on the availability of wild fruit on the market. Through the informal market, Farmer 6 has also learnt that consumers divide commodities into necessities and luxuries. The majority of consumers consider carrots, fresh peas, butternuts and some fruits to be luxuries which one can do without.

Other examples of knowledge spill overs are expressed by Farmers 8 and 18[50]. On the other hand, dealing with several farmers has enabled trader 3 to become almost like an agronomist able to advise farmers on varieties, time of planting and the best time for delivering to the market. By stimulating informed demand for information, the market has taught trader 4 to re-arrange her priorities. This follows a realization that Information and Communication Technologies (ICTs) like mobile phones are accelerating the pace at which informal agriculture markets churn out more information faster than a trader or farmer can digest and still remain focussed.

Trader 10 learned how the informal market creates its own language, metaphors and terminologies. The majority of farmers and traders describe the diffusion of potato and tomato seed technology and irrigation technology from the market using the word 'fluid' as a metaphor. According to Trader 14, information navigation is becoming a key component of

[50] Farmer respondent 8 has learnt about the importance of soil analysis while farmer respondent 18 has learnt about the important role of human senses such as touch, taste, smell and sight in determining the value of commodities in the market.

literacy. Farmers and traders are constantly discovering new things as they browse through emergent digital sources of information.

### 6.1.4 Keenness to share knowledge and lessons

Both farmers and traders have shown a strong keenness to share what they have learnt in the market. Some of these lessons have been proffered as recommendations[51]. From the informal market, according to Farmer 9, there is also consensus among farmers that rainfall distribution in space and time has changed although annual distribution has sometimes remained the same. Unfortunately, no one is documenting and producing relevant new books and manuals based on evidence on the ground and in informal markets. Agriculture knowledge should be a blend of what happens in farming areas, in the soil and on the market.

According to Farmer 20, the informal market has become major source of knowledge through diversity of ideas, openness and building farmers' ability to make sense of what is going on. Most of the information required by farmers is available in unstructured fragments and informal market enables a cohesive conversation. Farmer 21 has advice for seed companies[52]. On the other hand, Farmer 22 is worried that there are some important knowledge gaps among farmers. For instance, there is no knowledge comparing rainfall with groundwater fluctuations and dams. As a result farmers do not get a good picture of what goes on in terms of recharge and discharge country wide. Such information will empower farmers to use water wisely.

On the other hand, working in the market and meeting diverse farmers has opened Trader 6's eyes to the fact that food is the only thing that is common to everybody because it links directly to health. Most farmers now see the connection between tomatoes, potatoes and health. According to Trader 8, real innovation happens at the intersection of formal and informal agriculture markets. Traders and farmers are good at borrowing from both sectors and creating unique things. The informal market also enables a locally owned, alternative model of supplying affordable seed for horticulture crops.

[51] According to farmer respondent 6, farmers need a holistic approach to market trends and analysis rather than focusing on partial answers that consider commodities in isolation. Farmer respondent 8 advises other farmers that the demand for cabbages starts increasing in February every year. Farmer respondent 12 also weighs in with advice: "You do not just plant potatoes and tomatoes without a market.

[52] "Seed companies should go back to the laboratory and re-design their seed genetics for resilience to moisture stress and problems such as flooding which require a crop that can stand firm.

If documentation was the only source of knowledge, informal markets would have disappeared a long time ago, according to Trader 9[53]. Customers have become part of the informal agriculture market, according to Trader and Respondent 15[54].

### 6.1.5 The market as a key determinant of success

Feedback from farmers and traders indicate Zimbabwe has reached a stage where the market is a key determinant of success or failure. Availability of a market has become a finance model in its own right. If a market enables a farmer to meet the cost of production and remain with a profit from a particular market, such a market is as good as a finance model. Financing rural areas through the market increases the multiplier effect of money more than would happen if funding is given to farmers without a clear sense of market dynamics.

The market can easily direct financiers who to give loans. Those who bring commodities to the market and participate in the market clearly receive loans while those not participating cannot do so ahead of market actors. This is an example of a viable agricultural finance model. Another variation of this model is target financing informed by the market calendar. In most cases traders order as per demand, using market trends. They allow the market to be an assessor for the farmer. This is about financing the crop not the farmer. Part of what makes informal markets resilient is creating spaces for face-to-face meetings that have just enough structure to focus the interaction but not so much structure that it kills the spirit of informal learning.

## 6.2 The market as Information System

As shown by the majority of respondents in Chapters 4 and 5, the informal market is a predominantly person to person information system. Farmers and traders do not interact with computers and databases as sources of information. Although the information system overlaps with the formal system, person to person information sharing remains the basic thing. Knowledge is what farmers and traders deduce from the signals shared in the market through a person to person information system. The information system is informal because there are no formal structures for the organisation and the flow of information. This

[53] "Documentation cannot account for millions of undocumented knowledge and learning processes which occur daily in Mbare and other informal markets where oral knowledge sharing is the default".

[54] "Besides assessing customer loyalty through purchasing behaviours, I have also taken time to study customers' attitudes and sensitivity to price. I have also realized that ordinary consumers have adjusted their eating habits. All these dynamics impact the performance of potatoes and tomatoes on the market because these commodities have suddenly become competitors in the food basket."

information system connects with the special nature of trust, to be discussed in a separate section below.

Since the informal information system is not regulated or written down, trust becomes the essence of information exchange and knowledge system. People trust each other and trust the information they share[55]. In addition, farmers and traders do not remember information as data but what they remember is what is useful for tomorrow. The information is stored as memory and the informal market does not just build individual memory but group memory as well. As a result, for farmers and traders, learning is the capacity to use their memory. Aided by memory, on the surface, the informal agriculture market does not look like an information system. However, as farmers and traders always talk among themselves, this practice is a very effective person-based information system.

Information stored in individual and community memory has enabled farmers and traders to cope with change. Innovations such as crop and livestock breeding as well as the fashioning of farming equipment has been fuelled and sustained by imitation based on memory. According to farmers and traders, memory and imitation allow good ideas to spread quickly and efficiently. By distributing good ideas among many brains, the informal market enables memory to preserve ideas and copying mechanisms for future generations. This is exactly how farmers have saved and sustained indigenous crop varieties and livestock breeds. Farming and agriculture trading comes from lots of copying and creativity based on information stored in memory.

Feedback from the informal agriculture market is an invaluable tool for learning about gaps in the current knowledge system and an opportunity to see fine-grained details about what would work better for farmers and traders. Through the informal market and memory built through the marketing process, farmers and traders learn to create environments that support their success. To do so, they have to create a transparent and comprehensive data and memory tracking method that is a strong tool for change. Farmer and trader feedback about market failures and unmet demands can point the need for innovating new tools to directly address these demands.

On the other hand, technology is helping some farmers to bypass the “middle men” allowing market data and information on low-income consumers to be collected directly. Through information gathered in the market, farmers and ordinary people are now focusing on what

[55] More explanation - point 3.3 in Chapter 3 on the notion of trust.

matters – to feed their families and make sense of a changing climate through the effective use of data and intuition from the market. Conversations in farming areas and in the informal market are based on group memory which an extremely important innovative form of memory. Questions are important tools for retrieving and remembering what happened in the past although this information has not been written down.

## 6.3 The market as Community of Practice

The informal market is a unique Community of Practice (COP) based on group memory. Farmers plant potatoes and tomatoes based on information shared in the market[56]. After three or four months the potatoes and tomatoes are harvested and brought to the market where the conversation among farmers and traders picks up from where it was left before potatoes were planted. In the market they share ideas on whether the commodities produced are in line with ideas shared before planting. They also discuss varieties that do well and why they do well.

As a COP, the informal agriculture market is a platform for both individual and group memory. Due to the informal nature of the information system in informal agriculture markets, finding people who know is equivalent to finding the information one needs. Farmers and traders adapt more to information abundance by relying more on human relationships than official explicit knowledge in manuals and publications or organizational rules. That is why the informal agriculture market represents a full- fledged COP which makes the market as an institution more humane.

Through the market, farmers and traders rely more on networks of trusted colleagues than any particular source of information. That is why many informal market communities continue to function without formal education. Farmers and traders build their networks around people and agriculture markets where it is easy for farmers and traders to learn in the flow of their work and not trapped in classrooms or workshops. Through the market, farmers and traders also have more communities and social networks available for knowledge sharing[57]. That means the informal market is good at connecting people to learn together and co-develop knowledge. As a result farmers and traders make a quick transition from inexperienced newcomers to effective decision makers.

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[56] Farmer respondents 1 and 3 on how they have produced tomatoes and potatoes based on insights from the informal market.

[57] These practices contribute to existing Social Capital as expanded by NAHAPIET, J., GHOSHAL, S. 1998. Social capital, intellectual capital, and the Organizational advantage, *The Academy of Management Review*, Vol. 23 (2), pp. 242-266.

Under difficult circumstances like low prices, the informal market provides meaningful experiences that develop farmers' gut instincts and the capacity to deal with complex scenarios that are specific to their contexts. An opportunity to share stories and practices is a key learning point for farmers and traders. As a COP, the market is not just a big pool of people who engage in question and answer or small active teams with a lot of lurkers on the fringes exploring ideas where there is no question and answer. The whole market operates as a network of COPs according to different commodities. Farmers and traders do not allow themselves to be stuck in unviable value chains where they cannot share first - hand knowledge.

### 6.3.1 Coping with competition

Informal agriculture markets also play a key role in forging society by bringing different traders together in a competitive but harmonious way. The diversity and large numbers of traders coupled with the desire for traders to compete to outdo colleagues sometimes leads to conflict. However, the competitive attributes of informal agriculture traders and their self-employment activities call for complex negotiation skills and intricate knowledge that can enable them to balance communal and social ties with mutually beneficial collective action. In spite of tensions arising from existing complex networks of varied socio-cultural practices, highly mobile personal networks and a lack of strong formal institutional structures, informal agriculture traders and smallholder traditional farmers are able to conduct and sustain business collectively.

Although informal agriculture markets may seem to be beset by imperfect information and a widespread tacit enforcement of rules, deep-rooted relationships that breed friendship, trust and other associational character are common. In all three informal markets, farmers and traders have learnt to display various ways of engaging in coordinated effort. These include developing and promoting genuine friendships and alliances, caring for children of neighbouring traders, looking after each other's stalls and sharing food as well as engaging in savings clubs.

What also makes the informal market a COP is the presence of communal agreements, systems of shared languages, mutual ways of interacting and an implicit understanding of what is acceptable appears to be a characteristic of the wide scale tacit enforcement of rules. Traders form complex networks of interdependence and friendships with one another and with farmers. These relationships vary from those vital for accessing credit, borrowing and lending money to one another, to relationships for guarding stalls and others purely for

exchanging information on trading-related matters. The traders have also created associations that promote collective engagement and interaction among themselves and farmers. The role of the associations includes promoting the socialisation of economic activity**,** ensuring welfare rights of traders, settling disputes, controlling prices and regulating demand and supply.

Functioning as a COP bridges the divide that might exist among traders by permitting the effective movement of information and development of interpersonal relationships between traders and mitigation of risks. But more importantly, their ability to function effectively without any written procedures, rules or constitution makes them an interesting example of a COP that can exist as and through tacitly enforced practices of local agriculture value chain actors.

### 6.3.2 Peer learning in the Informal market COP

In the market farmers and traders know that getting feedback from experienced people, while engaging in peer learning, will help develop the next agricultural practices. Therefore the informal market is an opportunity for farmers and traders to create a lifeline of professional support for each other. It promotes exciting possibilities, enabling farmers and traders to learn from each other in ways that cannot be documented. All the commodities seem to fit well into the various avenues for connecting the part and the whole. The market thrives on cross-overs between collective thinking and collaborative practice.

By meshing individual learning with collaborative learning, the market is uncovering better ways of developing agriculture by doing it and helping others do it. Through faster feedback loops, farmers and traders are empowered to be contributors to the market. Everyone learns how to collaborate more effectively while respecting everyone else's contribution. There is much capitalisation of lessons learnt from practice. Learning can be as simple as taking a moment to ask the next person to help. To this end, the market builds comfort levels among farmers and traders to know that no-one knows everything. Through the informal agriculture market, there is enormous capacity to generate public wisdom because interactions are informal[58]. Farmers and traders are connected in ways that allow them to move and do things in various impromptu alliances that give them the maximum leverage on emerging opportunities.

[58] Trader respondent 16 on the size of different informal markets under the research.

For farmers and traders, the responsibility for learning rests on individuals not formal schools. They are now aware that creativity, learning and the desire to help fellow farmers cannot be controlled. This awareness has motivated them to deliver quality products to the market. There are more rewards as well as self-esteem and dignity in taking responsibility for developing one's own knowledge. Discussions with other farmers and memory helps farmers retrieve thoughts and comments made earlier, particularly when responding to questions from other farmers or traders. In the informal market, everyone contributes to collective knowledge and this in turn makes the informal market effective in dealing with problems. It shows every farmer or trader has their own way of working more effectively and contributing to society. Where the formal market tries to divide things into categories and opposites, the informal market embraces collective thinking and collective learning. The market portrays ideas and practice, individuals and community, at the same time. For farmers this triggers an entirely new shift in thinking from where they have been used to one way extension messages. The market has its own pattern languages[59] which ensure farmers and traders are able to learn while creating and responding to change. The emphasis is on individuals and interactions rather than over processes and tools. There also are working and sustainable projects over comprehensive documentation and reporting.

### 6.3.3 Potential to influence formal knowledge systems

By working together in the informal agriculture market, traditional smallholder farmers and traders are generating a body of knowledge that combines efforts, learning and potential to influence formal knowledge systems. Many issues become apparent from this research in terms of our perspective on knowledge. Farmers' and traders' willingness to learn and share information and perspectives is an indication of how they are becoming savvy as business people. They learn about the products (potatoes and tomatoes) through experience (farming and marketing), leading to high-level of openness about learning. They do not depend on the formal knowledge system but use the informal market to develop their own skills and economy. This means there is a high prevalence of "informal learning" and "informal thinking". It seems the informal economy has its own "school" from which it produces knowledge that makes sense to farmers and traders in the informal agriculture economy. It seems the informal economy will not disappear even if proper formal education is extended to everyone. Knowledge systems that support the informal economy will continue to exist alongside the formal education system.

[59] Trader 18 on the language in informal markets.

Traditional farmers (smallholders) are not scared to use fertiliser and seed products which they get from formal seed houses and other modern sources mainly accompanied by codified knowledge in the form of packets with instructions on how to use the seed. The farmers also use fertiliser and lime in their soils without caring to understand the science behind scientific processes through which inorganic fertiliser is created[60]. Just as ordinary people do not have to know everything about a car in order to drive and use it, smallholder farmers do not have to know the science behind Nitrogen, Phosphorus and Potassium (NPK) in order to use fertiliser. Things do not have to be entirely explicit for people to start applying their tacit, experiential and embodied knowledge.

Asking farmers and traders to write down all their knowledge would certainly impede their creativity and innovation which is largely a tacit process where ideas and information is matched and used according to the prevailing context. Money represents the explicit side of things in informal markets. Traders and farmers need to understand income and expenditure to a certain degree, otherwise they are not making any progress. Traders and farmers work with United States Dollars (US$), the South African Rand (ZAR) and Botswana Pula. Although this is confusing in terms of change and estimating the true value of their commodities, they cope through innovating and other ways of estimating value. Barter deals where farmers and traders exchange commodities instead of money are also prevalent in the informal market[61]. To a large extent, traders and farmers have higher levels of innovation towards managing money and risk. An indication that farmers and traders in the market are successful is that they continue doing business in the market continuously. This means they make enough to plough back into the progress of their businesses. Many of the farmers also produce high volumes of tomatoes and potatoes so much that they benefit from economies of scale.

While cash flow is the basis of any business, traders and farmers manage to survive without a rigorously codified cash flow but use tacit knowledge to accurately read the market. They have learnt the basics of a modern economy where money is the oil. However, they complement money with barter deals. Their reluctance to pay Value Added Tax (VAT) directly means they know that the tax collector does not assist their businesses but wants them to replenish state coffers for the benefit of those in the formal economy. However, they

[60] Farmer respondents 3, 8, 11, 13, 14, 15 and 18 have all become conversant in use of inorganic fertilizer as a result of knowledge from the informal market.

[61] Farmer respondents 3, 4 and 6 have embraced barter deals as a result of exposure to the informal market.

do not mind paying sales tax when buying seed or packaging material and other inputs. Although they may not know about cash flow, they are aware of the principles. By refusing to pay VAT, it shows traders and farmers are better informed about their economic environment.

The unavailability of formal employment has seen many young university graduates joining the informal sector where they try to use their knowledge for survival. Being technologically adept, these young people have started harnessing the advancing mobile technology[62] with informal trading in ways that give informal markets a different knowledge configuration than would be the case if the informal markets continued to be a domain of those who failed in formal education.

### 6.3.4 Knowledge pathways in informal agriculture markets

From this research, it seems informal agriculture markets sustain and strengthen themselves through open knowledge sharing pathways. The researcher counted 14 Knowledge-Sharing Pathways in each of the markets under this research: (1) Farmer to Farmer; (2) Farmer to Trader; (3) Trader to Farmer; (4) Farmer to Consumer or End-User; (5) Trader to Consumer or End-user; (6) Consumer to Consumer; (7) Farmer to Transporter; (8) Transporter to Farmer; (9) Transporter to Transporter; (10) Trader to Transporter; (11) Transporter to Trader; (12) Transporter to Consumer; (13) Consumer to Transporter; and, (14) Consumer to Farmer. This is unlike in the formal economy where you find that even if companies are in the same line of business, one is doing well while the other is folding up. Knowledge-sharing pathways tend to be secretive and individualistic in the formal economy. On the other hand, in informal agriculture markets, knowledge is often repaid with knowledge[63]. Everyone learns from others resulting in a rich knowledge ecosystem which does not involve monetary compensation or formal training. From this perspective, informal markets foster a true COP where everyone is interested in the continued existence of a robust knowledge system as a common.

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[62] Farmer respondent 10 as well as trader respondents 12 and 14 have harnessed mobile technology to their agriculture activities.

[63] This seems to be a critical part of situated learning which LAVE,J. and WENGER, E. deal with in *Situated Learning: Legitimate Peripheral Participation* New York: Cambridge University Press, p. 40.

In the informal agriculture market, traders involved in either potatoes or tomatoes always share comparative advantages. While what is known to one trader may not be known to the other trader, success comes from combining what they both know. What is not known has been completely discarded. According to one trader, "If you do not know how to do your financial books do not try because you will mislead yourself into thinking you are making a profit when you are not". Traders do not just do things to impress formal financial institutions and their associated ways of validating knowledge. For instance, traders do not know the purpose of tax clearance or company registration. Being at the centre of farmers and consumers, traders have to satisfy both sides. Due to experience on the informal market, traders pay a critical role in determining the quality of commodities on the market.

## 6.4 The market and trust

To the extent that traders and farmers rely on each other, the informal market enables reliability-based trust which stems from consistency in supply and predictable production capacity towards meeting market expectations. Importantly, in the context of trust, these expectations are positive. Reliability may be important to stakeholders that have little information regarding the motives or integrity of the organization, but who still rely on consistent and dependable behaviour. Farmers who bring their produce to the market expect to receive their cash on the day of the sale as opposed to waiting for 21 days. The informal market ensures this happens on a daily basis.

To the extent that farmers and traders in the informal market have a shared identity, there is identification-based trust which stems from value congruence, and the perception of a shared identity. Due to sense-making needs and dissonance-reduction demands, farmers and traders examine the extent to which they share goals, values, norms and beliefs associated with the culture in the informal agriculture market. Therefore, the informal agriculture market concurs with the hypothesis that states that trust across stakeholder groups is a function of perceived competence, integrity, benevolence, transparency, reliability and identification[64].

When relationships become more intense and anticipated frequency of contact increases, a demand is created among stakeholders for consistency in the behaviour of the organization.

[64] The strengths of informal agriculture markets are based on trusting relationships. Context is a critical part of this as discussed by LEWICKI, R. J., BUNKER, B, B. 1995. Trust in Relationships: A Model of Development and Decline. *Conflict, Cooperation and Justice Journal, San Francisco, 133 – 173.*

This also applies to farmers and traders who interact in the informal market. Frequent interaction enhances relationships between farmers and traders leading to barter deals based on solid trust[65]. As a result, reliability becomes a crucial factor in the development of trust. Repeated cycles of exchange, risk-taking, and successful fulfilment of expectations strengthen the willingness of trusting parties to rely upon each other and expand the resources brought into the informal market for exchange. Intense relationships entail not only the need for, but also the capacity for more information exchange.

### 6.4.1 The relationship between trust and knowledge

As this research shows, what researchers in Western European countries like Germany and Switzerland have found about trust also applies to informal agriculture markets. The role of trust in the market tallies with what Noteboom[66] has discovered in his works on the relationship between trust and knowledge in western European contexts. The trust issue differentiates the informal from the formal market. Nobody trusts anybody in the formal economy as shown by the use of receipts, bank transfers, identification particulars, affidavits, etc. On the other hand, trust is what makes the informal market thrive. Without trust, the informal market would collapse. Noteboom argues that there can be no functional knowledge organisation without trust. As a key ingredient, trust enables farmers, traders and consumers to agree on the specific value of commodities. Incumbent upon trust, tomatoes can be exchanged with maize, the value being agreed upon without any problem.

Informal traders and farmers operating in the informal sector trust each other and the information they share. They make decisions based on trusted information from trusted peers. Farmers respond very quickly to the signals that come from traders. They learn and adapt. For instance, if traders say a particular variety of tomato is not doing well on the market, farmers respond by identifying and producing the correct variety[67]. When the price of a commodity is much lower than the value farmers attach to the commodity, they arrange barter deals with a commodity that is fetching a higher and sell that substitute commodity at a viable price. For example, three buckets of groundnuts can be exchanged with a pocket of potatoes.

While the formal market tends to be a domain for the few who are mainly formally educated, the informal market takes everyone on board and thrives on trust. Trust drives the local food

[65] Trader respondents 8 and 10 have testified to the importance of trust and relationships.

[66] The notion of trust is expounded under 3.3 in Chapter 3.

[67] Trader respondent 8 explains how knowledge on existing varieties travels between traders and farmers.

economy. Trust is also based on taste. Farmers, consumers and traders know that food which does not smell or taste[68] well is not nutritionally good. Therefore, trust is not only a fundamental issue in agriculture but drives the local food market and direct selling from farms. Due to trust, local food systems like Mbare, Mutare and Bulawayo informal markets have shown capacity to break away from the use of money as the only medium of exchange.

Through trustful relationships, farmers and traders devise means of circumventing excessive regulations. Without trust they would spend a fortune on regulations alone. Trust shown in the informal market can also be used to preserve food freedom. The informal market ensures local producers are trusted to balance supply with demand within their community and the market. This is contrary to the formal market where prices are sometimes distorted through fixing commodity prices.

### 6.4.2 Trust and interdependence

The inter-dependence in informal agriculture markets also reveals the importance of trust. The informal market is the only place where relationships between people from different backgrounds (social, ethnic, academic, etc.) can be brokered. This is unlike formal or academic environments which are full of like-minded people. In a day and age where trust and attention are becoming some of the most important business assets one can have, farmers and traders in the informal market resort to drastic measures like creating strong relationships irrespective of whether or not money is ever exchanged. One of these drastic measures includes allowing consumers to taste goods before buying. This is a technique for building trustful relationships.

The essence of strong relationships between buyers and suppliers is trust, which in turn affects the supplier performance and consequently the agriculture market's performance. Face to face communication and fair treatment of supplier by buyer is positively related to development of trust. Development of trust has a positive influence on readiness of supplier to invest in the specific requirements of buyer. A strong relationship between buyer and supplier positively affects supplier performance and supplier performance is positively related to the market performance[69].

The informal market builds a strong sense of team work among traders and farmers who all have a key interest in the continued existence of informal agriculture markets. Traders and

[68] Trader 18 demonstrates how human senses such as taste have become important in the informal market.

[69] Trader 18 explains how understanding consumer needs results in strong relationship that contribute to market performance.

farmers are increasingly coming together to produce mutual benefits and the relationship between them has become strategic in nature, therefore both traders and farmers can be considered as business partners. At this stage, trust becomes the leading actor to govern the buyer-supplier relationship. There is a sincere desire to proceed in trust building activities.

Due to the existence of trust, consumption of time and resources in the negotiations gets reduced. The climate of trust allows open sharing of information. Long-term relationships can be built only when there is mutual wish to work together and partners agree to share information. In order to coordinate the flow of agricultural commodities traders and farmers need to communicate. Information regarding product prices, contractual arrangements, delivery schedule, technical details and other strategic issues need to be discussed. Therefore, communication can be considered as an essential component in the relationship and trust development. Face-to Face communication and fair treatment of suppliers by the buyers have a positive effect on the development of trust. A successful relationship is one, in which, there are mutual benefits, because success of both farmers and traders are interdependent.

### 6.4.3 Dynamics of knowledge-generation and trust building in informal markets

Informal agriculture markets highlight the dynamics and interdependence of knowledge generation and trust as well as sources of trust building in terms of three different components (generalised trust, specific trust, and institutional trust). Spatial and socio-cultural proximity fosters trusting relationships between agents. These trusting relationships are seen as the fundament of knowledge-transfer and the mutual development of new knowledge within regional innovation networks[70].

A well-balanced mixture of a diversity of knowledge (or cognitive distance[71]) and homogeneity of knowledge[72] as well as differences in the cognitive style and creativity, necessary for the generation of new knowledge, are required. Trust allows agents to rely on other agents without permanent fear of having to safeguard against opportunism[73]. The informal economy shows trust exists within economic relations and a relative high level of trust is needed in order to conduct collaborative innovation processes like agriculture production and marketing of agriculture commodities. There is a positive correlation between

[70] Powell, W. P. 1990. "Neither Market nor Hierarchy." *Research in Organizational Behavior*, 12, 295-336.

[71] Nooteboom (2000). Nooteboom, B. 2000. "Learning by Interaction: Absorptive Capacity, Cognitive Distance and Governance." Journal of Management and Governance, 4(1) p. 69-92.

[72] Cannon-Bowers, J. A., and Salas, E. 2001. "Reflections on shared cognition." Journal of Organizational Behavior, 22, p. 195-202.

[73] Deutsch, M. 1962. "Cooperation and Trust: Some theoretical Notes." *Nebraska Symposium on Motivation*, p. 275-319.

the trust and the benefit the agents ascribed to their participation in informal agriculture markets as networks.

### 6.4.4 The nexus between trust, knowledge and barter trade

In all informal agriculture markets under this research, trustful relationships are strongly linked with knowledge sharing and barter trade. When hoarding commodities from farmers for re-sale, traders use their knowledge or instincts to determine the volumes that can be bought by their consumers[74]. They do not have cash flow projections but resort to their instincts and knowledge of business. While the value of commodities in modern commerce is determined by price in the form of money, the situation is different in informal agriculture markets where the value of a commodity is transferred from the trader to the commodity and then to the farmer. A pocket of potatoes can be worth two buckets of maize but when the potato seller raises the pocket to feel its weight, s/he may put its value at three buckets of maize. In this case, feelings and instincts are useful in determining value.

In informal agriculture markets, barter trade addresses the cash crisis, as experienced in Zimbabwe during the time this research was conducted, in meaningful ways through less use of cash as a means of exchange. Barter trade also shortens the transaction process. One does not have to look for someone from whom to borrow money or wait for someone to send money in order to purchase a crate of tomatoes. The exchange is done fairly while looking at the commodities to be transacted[75]. Through barter deals, a commodity looks for another commodity that matches its value within the market, for example, a crate of tomatoes for a bucket of groundnuts or a bucket of maize. Where maize is abundant, farmers buy tomatoes using gallons or buckets of maize. There is no need for mobile money arrangements because there is no cash to be send. The auctioneer is invisible as two people agree on the value of their commodities before exchanging. Sometimes the monetary value of one commodity is used as a basis for valuing it. In this case, barter trade is a matching making fair where a commodity that fails to find a match is not sold.

Regarding trust and relationships, relationship building starts with the value an individual attaches to his or her commodity. Whoever buys that commodity should pay an equivalent of the trust and value the seller has on his/her commodity. The seller's trust in his/her

[74] Trader 18 on the importance of instincts and other human senses in determining the value of agriculture commodities in the market.

[75] Trader respondent 18 also shows how negotiations are much more fulfilling when both sellers and buyers are looking at the product in the informal market.

commodity is transferred to the buyer. At the other end, consumers and traders have expectations and values which they transfer to the producer. The market matches values and expectations from both ends[76]. If they do not match there is no relationship. This is different from modern commerce where sellers sometimes manipulate figures. A farmer calculates his/her profit or price before going to the market and when s/he faces competition in the market, s/he remains stuck in figures. For instance, a farmer can say, "I want 25% profit" even when the situation does not accept that figure. On the other hand, informal markets operate on the basis of commodity value and relationships which last longer. These relationships are sustained in the market.

Most traders specializing in tomatoes, potatoes or butternuts have built a niche market based on relationships and trust. Although this knowledge is not documented, it informs them on how to stock or re-stock (re-order levels) at different times. Relationships explain why someone continues to specialize on potatoes for decades even if there are opportunities to embark on other high value commodities like cabbages or butternuts. If you fail to meet your customer requirements as a potato trader, your relationship with them is compromised. In one way or another, farmers, consumers and traders go further to discuss how they are related through totems, e.g., *Moyo* or *Shumba.* People who are sensitive about totems tend to buy from those with whom they share surnames, for example, *Mhofu* to *Chihera*.

There is also something about place of origin, e.g. a trader from the City of Masvingo can be known in the market as Masvingo which means people from Masvingo may want to give him first preference. Before talking about money, farmers and traders talk about relationships and places of origin. Depth in interaction along clan names leads to cross-fertilization of knowledge. If a trader comes from Masvingo, s/he becomes a node for farmers/consumers from Masvingo. These people can also use their relatives to reach out to Mutoko knowledge through the Masvingo trader's relationships with many other traders in the market. In the same vein, a trader from Manicaland can do business on behalf of his community. It is easier for farmers from Manicaland to leave their produce with a trader who comes from the province.

A number of tomato traders were once tomato farmers who have perfected their art through learning from production up to the market. Conversely, in the modern commerce sphere, formal qualifications are considered more important than practical wisdom. Someone can

[76] Farmer respondent 16 and trader respondent 6 reveal how the informal market matches values and expectations from many actors.

enrol at University to do agronomy even when s/he grew up in urban areas with no exposure to practical farming. It gets worse when this person becomes a policy maker when s/he does not have practical agriculture wisdom. A trader who grew up farming can be a better policy maker than this person. Some traders inherited their trading businesses from parents and are teaching their children how to run businesses, for example, how to offer a discount. For example, when a customer buys tomatoes worth more than a dollar the customer is given a discount in the form of one extra tomato. This *mbasela* principle common in informal agriculture markets is a form of discount. A customer who buys 10 tomatoes for a dollar and gets one extra as *mbasela* to make them 11 has a10% discount since the price of a tomato becomes less than one Rand.

## 6.5 The market as a Learning Organisation

### 6.5.1 The informal agriculture market as a learning ecology

The informal agriculture market context has become a learning ecology with substantial richness. Farmers and traders do not just learn from each other but often make their own extensions and modifications to their businesses[77]. Learning is sparked by conversations and informal ways of sharing information. How informal actors (farmers and traders) learn is an important starting point in understanding their knowledge system. Through the informal market, farmers and traders can explore new means of expression and argumentation in nonlinear, interactive, and time-based media. While some training programmes by formal institutions focus on pushing information, the informal market shows that learning comes from pulling by farmers and traders. Mobile technology is also supporting the view that learning in the informal agriculture market will increasingly rely on personal interaction, communication and peripheral participation. Environments like informal markets are beginning to acknowledge the interactive and social basis of learning and finding ways to achieve a balance between discovery and reflection in situ[78]. Farmers and traders find ways to support the emergent aspects of learning that come from witnessing not just a wide range of courses, but also from experiencing a wide range of communities of agriculture value chain actors in the informal market.

The informal market has enabled farmers and traders to condense their knowledge into one-liners, idioms and metaphors that are easy to convert into individual and institutional

[77] Farmer respondent shows how knowledge from the market is integrated with what the farmer already knows.

[78] Farmer respondent 24 and trader respondents 3 & 8 explain how the market promotes situational discovery and reflection leading to more knowledge.

memory. They also learn from traditions in other farming areas like wetlands which are sources of tomatoes, groundnuts, maize and wheat for the market at the beginning of summer when everyone else is embarking on farming activities. Wetland areas like Chihota, Mutoko, Mhondoro (Watyoka, etc), Serima in Gutu and Mahusekwa are blessed with soils where moisture rises to the surface in August, enabling them to produce groundnuts, green mealies and wheat. These groundnuts and green mealies show up on the market in November and December, fetching better prices when all the other areas are not producing. It is in the interest of every farmer to know sources of produce like wetlands at any given time. By going to the market, farmers are able to see and hear the contribution of different soils and agro-ecological zones to markets and food security[79].

Farmers and traders are now embedding their proverbs, idioms and other narratives into mobile technology. They believe in orality or the art of speaking one's mind. Speaking is more efficient than writing (documenting)[80]. Farmers and traders feel more satisfied when they call each other than communicating through short message service or Whatsapp. This is because through documentation (messages or WhatsApp) one cannot show emotions, enthusiasm and facial expressions. Orally one can express an idea in five minutes when it would take a whole day to put it in writing. Through orality, the market is purely about relationships. There is also a lot of animation – how farmers and traders deal with nature, soil, water and associated rhythm (music).

### 6.5.2 The informal market as facilitator of coupled learning and performance

As revealed in this research, the informal agriculture market generates applied knowledge[81] that makes agriculture production and marketing processes more effective. While formal knowledge is important in a modern economy, it has to co-exist with informal knowledge otherwise science and technology will only facilitate dependence and exploitation. When governments and NGOs talk about formalizing informal learning, they probably mean making informal learning routine and accepting that as legitimate learning. However, making informal interaction between farmers and traders formal will completely kill it because oral and informal ways of working are more efficient than documenting (making it explicit) every step. However, local and informal knowledge alone is not enough for farmers to fully benefit from their natural resources. Years of colonisation have weakened local knowledge

[79] Farmer respondents 11 and 14 reveal how the informal market speaks to soils and agro-ecological zones.

[80] Trader respondent 9 shows how the market does not thrive on documentation but memory.

[81] Farmer respondent 14 and trader respondent 17 show how applied knowledge is generated in the market through both individuals and groups.

development processes such that many people have stopped innovating around their knowledge. Conventional agricultural extension processes are no longer enough in the current ubiquitous information age.

When formal knowledge in the form of science reduces reality to what is measurable and quantifiable, meanings and values can be lost in scientific representation. On the other hand, informal markets try to bridge the gap between formal science (quantification) and local informal knowledge (the sociology of how people relate and institutions they develop, for example, informal regulations). While it is important for scientists to reduce reality in order to investigate specific questions, the informal agriculture market shows that the scientific result constitutes a partial and selective representation of reality[82].

As shown by this research, knowledge is not only used to describe, understand and interpret the world, but it also enables people to achieve socio-economic ends and values[83]. Contextually valid knowledge gives farmers and traders the power to act and realize their goals appropriately. For instance, the use of informal knowledge and mobile technology fulfils the realization of changes in farmers' bio-material world and changes in the agriculture market. Through informal agriculture markets, traders, farming communities and informal markets are mutually shaping each other to an extent that there is a mutual shaping of technology, society and nature. However, technology in the form of herbicides has also affected informal learning among farmers. Collective efforts like weeding together as a community are slowly dying thus affecting co-creating of knowledge which used to characterise how communities have traditionally worked together.

Mobile technology is also shaping socio-economic relationships and interaction patterns between farmers and between farmers and traders. Mobile technology has allowed farmers and traders to communicate and share knowledge 24 hours a day in line with the movement of potatoes and tomatoes from production areas to the informal market. Widespread use of mobile phones has made it possible for mobile operators to compete with the banking system by allowing farmers and traders to exchange phone credit rather than pay through a bank account. Similarly, the power balance between farmers and traders is changing due to increased transparency about prices in the market.

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[82] Trader respondents 16 and 17 on how the informal market is different from formal knowledge systems.

[83] Farmer respondent 6 and trader respondent 11 reveal how the market enables participants to meet their needs and values.

Farmers and traders have proven to be brilliant at grounding ideas into practice in ways that their peers can follow[84]. The informal market helps them to crowd-source ideas. They have also become accustomed to the open-ended uncertainty associated with agriculture markets[85]. Uncertainties in agriculture markets compel farmers and traders to become strategists who can also cope with climate change. The changing climate and unpredictable markets amplify the importance of agility in a rapidly changing world. A crop or livestock calendar is no longer enough without a market calendar. Farmers and all agricultural value chain actors are forced to go beyond templates and calendars, and mirroring the dynamism of the external environment. Agriculture value chain actors like farmers are stretching beyond strategic planning to take advantage of opportunities in the market[86].

As effective value chain actors, smallholder traditional farmers have found ways to transform their strategy development into an on-going process of ad hoc and daily topic-specific conversations. Some traders now have a professional credibility that extends well beyond traditional process-facilitation roles. They are using mobile technology to pull ordinary citizens into agriculture and food security conversations. The informal market helps farmers and traders to identify trends, shocks, and competitive behaviour that keep agriculture alive[87]. Both farmers and traders are increasingly realizing that basing priorities on prior experience does not necessarily correlate with better agribusiness performance.

### 6.5.3 How traders and farmers tap into the synergies of difference

Informal agriculture markets are a common pool resource, managed cooperatively like a commons. As revealed in chapter 4, both farmers and traders have a brilliant way of grounding ideas from the informal market in practice, which are great acts for others to follow. There is crowd-sourcing of ideas[88] and tapping into the synergies of difference. Through the market, farmers and traders arrive at the same set of ideas from different directions like the unstructured, emergent, self-guiding elements of informal markets. They think and talk about the market in patient ways.

Farmers' and traders' reliance on the emergent culture of informal agriculture markets shows the values of the informal market as a network. The informal market has several pathways

[84] Farmer respondent 12 shows how he has successfully followed the footsteps of fellow farmers.

[85] Trader respondent 13 on how market uncertainties have become a source of knowledge.

[86] Farmer respondent 8on how the market opens new opportunities.

[87] Farmer respondent 9 & 23 and trader respondent 18 on how competitive behaviour in the informal market generates knowledge.

[88] Trader 15 on how the informal market reinforces crowd-sourcing of ideas.

that link the local and the global[89] agriculture arena. Farmers and traders have built their knowledge through their histories. However, like all human beings, farmers and assimilate external concepts with local taste, almost reinventing locally a concept that was originally external. Once an external concept is introduced inside a local market which is also a local cognitive space, it starts modifying what previously existed there. People start to re-understand what they already knew. It is a transformative and sometimes culturally destructive process which comprises local knowledge.

To a large extent, local knowledge that exists in informal agriculture markets is permanently reinvented. It reinvents itself by using elements of global knowledge as raw materials. Informal markets localise materials and capture local knowledge – feeding it into the global knowledge base, but they also translate and repurpose historic and centralised knowledge products like basic technical briefs on things like tomato or potato harvesting. By providing feedback[90] to tomato and potato seed companies, farmers and traders add value to the global knowledge products with their own local contextual information. However, many farmers and traders struggle with how to meaningfully engage with the rich thread of activities in informal markets. There is so much to react to but it is better to be selective. The informal market tries to simplify what is a very complex phenomenon, and one that is intimately connected with power (e.g. to define agriculture discourse, to regulate participation or to broker the value of commodities).

## 6.6 Policy Implications

While the government of Zimbabwe has invested heavily in formal education which focuses on 'topical knowledge', a useful way forward probably requires a rethink of the whole schooling/education system towards two streams where a young person could decide to go the more "formal" education direction, or into the more "informal learning" direction. That could probably mean from the age of 13 or 14, an "informal learning " inclined young person could already be making informed business decisions and starting their own informal business. This would stand them in better stead than Ordinary levels, Advanced levels and degrees would. If these young people got a business going and established but decided on formal education, funding it would not be a big problem. This kind of education will

[89] Trader 10 on how horticulture seed comes from India and Europe where the knowledge has been deepened over many years.

[90] Farmer respondent 21 has some piece of advice for seed companies based on experiences from the informal market.

certainly enable young graduates to hold space for complex environments such as the informal market. Such skills will ensure they become forces in shaping the future of work of developing countries like Zimbabwe. Emerging economies and developing countries seem to require smart learners that are able to engage with smart technologies.

Every one of the major challenges facing the Zimbabwean economy is complex. Despite this, Zimbabwe's formal education system does not teach an understanding of complexity. Understanding complexity must also be part of any informed discussions on government policy or agricultural governance. Besides mirroring the agriculture sector, the informal agriculture market provides the best education for understanding agriculture as a complex system not just a value chain. Through the informal agriculture market, individual farmers and traders have taken control not only of their learning, but have built professional social networks for knowledge-sharing and cooperation. Information and evidence from the market is helping farmers and traders to make sense of complexity and easily share new insights in terms of volumes and diversity of agriculture commodities searching for a market.

To the extent that farmers and traders are feeding themselves, they should be left alone to do their business. Eventually their business growth will force them to become formal. Circumstances will force them to codify their work step by step because there is a point beyond which they can remain informal or continue using their memory all the time. Using income from potatoes and tomatoes, farmers buy cattle as a way of storing capital rather than putting money in the bank. For traders, capital is stored through diversifying into other high value crops such as bananas and green peas.

The findings from this research have shown that a development policy that opts exclusively for value chain development and the integration of farmers and traders in modern markets should not overlook the reality for the majority of smallholder farmers and traders. Due to the unpredictability of farming, it may be impossible for many traditional smallholder farmers to meet the quality required by formal institutional buyers like Fruit and Vegetable Company. Through the informal market, traders can buy from the farm gate, thus cushioning the farmer against transport costs. The rapid spread of mobile phones and increase in the number of traders competing for the farmer's tomatoes or potatoes increases income for farmers through competitive prices and transparency in prices. For consumers, the informal market is often more accessible and more flexible in responding to new opportunities and can better satisfy traditional tastes than the formal market.

### 6.6.1 Volume and not kilogrammes as the language in the informal market

The value and prices in informal markets is determined mainly through volume as opposed to weight (kilogrammes) used in formal markets. Financial institutions, researchers, development organisations and policy makers should strive to understand this language because it is the one used to translate commodities into business growth patterns and performance. If a bank is going to fund a farmer or trader, the language is in volume (boxes)[91] not weight (kg) or hectares. The question to a farmer should be: how many boxes are you going to produce not how many kilogrammes or hectares are you going to plant? Boxes translate to projected sales and potential to repay loans. In measuring their harvests, smallholder farmers do not speak in terms of tons but bundles, boxes, 50kg bags, scotch carts, etc. While the formal and Western education system in the country is still teaching school children and students to express the value of agriculture commodities in kilogrammes, grams, millilitres, litres and parts per million, the informal agriculture market shows the existence of a localized knowledge system through which value is expressed. This language makes sense to the majority in the informal market and households.

Getting information from the market and expressing it in dollars per kilogramme may not be helpful to farmers, transporters, traders and the majority of consumers because they do not use kilogrammes when transacting or talking about commodities in the market. Policy makers have to recognize the way commodities are measured and valued in informal markets where the majority buy and do business. At the moment, food security is spoken of in metric tons of maize in the strategic grain reserve. What about tubers like potatoes and sweet potatoes that are recorded and measured as 50 kg bags, converted into $30/50kg bag?

The value of a commodity should be determined by the market which has its own language showing ordinary people's adaptive practices. The informal market has a unique language which has to be documented and used to show the distinctiveness of African informal economies. The language is expressed in 50kg bags, boxes, crates, baskets, 10kg pockets, 15kg pockets, 5 litre tins, 20 litre buckets, cups, bundles, etc. The performance of horticulture in African countries should be understood through this language and measurements.

[91] Trader respondent 18 on how the value of commodities is understood in volumes such as crates, boxes and baskets in the informal market. The use of kilogrammes and other weight-based measurements of value is not very common in this market.

On a daily basis, households purchase tomatoes and potatoes from the informal market for daily consumption using language in the informal market. Traders, food chain stores and farmers supplying commodities throughout the country also use this language. Cash is exchanged from vendors to traders and back to the farmer using this language. If properly managed and expressed correctly, this language can boost agribusiness and food security in African countries like Zimbabwe. This language can also help African countries in correctly measuring their Gross Domestic Product (GDP) in ways that can be understood by the majority. GDP should be an expression of how ordinary people do business.

The success of any business revolves around its language. Formal institutions like universities some of which have been around for more than 100 years are still expressing knowledge in western measurements like tons and kilogrammes instead of learning and adapting from the informal market. Perhaps they can try to modernize and improve boxes and baskets which are a standard measurement for the majority in terms of quantity. Even manufacturers of packaging material can adapt this and come up with improved baskets.

### 6.6.2 The role of informal markets and intermediaries in agriculture markets

Understanding the informal agriculture market can help policy makers in coming up with meaningful and grounded agriculture innovations. Such innovations can include changes in the formal and informal rules and arrangements that orient the way farmers and traders interact in the market (i.e. institutional change). This can shed light on why some accessible and effective agriculture technologies may not be easily promoted. For example, until quite recently, most efforts in formal research and extension systems went into developing pathogen-free seed potatoes produced by specialized breeders and sold on both the formal and informal market. This kind of research was popular among donors and the private sector as well as among scientists because of high-tech work that could be done with the help of genetic information. In practice, however, few farmers could actually afford and access such high-quality seed potatoes. In response, some farmers have resorted to their own seed saved from the informal market. At the edges of the formal system, farmers in Mutoko and Mutasa districts of Zimbabwe experiment with the re-introduction of on-farm positive selection of seed materials.

The informal agriculture market represents different technologies and modes of marketing with distinct patterns of interdependence and power configurations. In essence, these different value chains represent different patterns of interweaving and coupling the bio-material and social aspects. In complex setting like informal agriculture markets, meaningful

change happens in networks of interdependent actors who cannot change if others do not simultaneously change. Therefore, innovation depends on different stakeholders (e.g. parties in a value chain) adopting different practices in a more or less concerted manner – based on some kind of coordination, agreement and mutual expectation. This implies that adopting innovations is often not an individual affair as is suggested by regularly used models of innovation and behaviour change. Complex interdependencies and regularised interaction patterns in networks like informal agriculture markets tend to constrain the space for meaningful innovation because a number of actors in the network are likely to have vested interests in maintaining the existing situation.

At the same time, we need to acknowledge that the world is changing continuously, despite structural constraints such as market regulations. In informal agriculture markets, new orders emerge usually without central steering and control from government regulations. The processes of self-organisation play an important role in bringing about patterns of change. It is through communication that proponents of alternative technical and institutional futures strategically influence others and forge discourse coalitions. Thus, meaningful change is dependent on changes in discourses, representations and storylines that are mobilized by interacting farmers and traders. Such communicative devices play a significant role in the continuous ordering and re-ordering of the informal market, and in the preparation and enactment of socio-technical change. Change in the informal market is both reflected in and produced by shifting conversations between farmers, traders and other actors, either through social media or face to face interactions.

Through engagement and conversations, farmers and traders integrate data and insights into their communicative performances, and use them to pursue their own socio-economic ends, or even as symbolic 'weapons' in their struggles. In complex settings like informal markets, policy makers have to more deliberately place science in the on-going dynamic rather than maintain the somewhat illusory idea that scientists are or can be outside observers. Agricultural research should be a collaborative endeavour between scientists, farmers, traders and the informal market. While there are existing efforts to involve farmers in participatory research processes, at the moment such platforms are established mainly for diffusion purposes and become inflexible and artificial structures that remain disconnected from on-going initiatives and dynamics in informal agriculture markets.

Embedding of research in on-going processes of change, and in supporting meaningful innovation in complex settings like informal markets requires new kinds of professionalism

and support. Catalysing and supporting change may usefully involve orchestrating new connections and coalitions between agricultural actors and disciplines as well as mediation in situations of tension and conflict. It can also involve the facilitation of exchange, learning and vision building among diverse communities of farmers, traders, extension officers, agro-dealers and other actors. Such roles can be performed by 'innovation intermediaries' - an organisation or a body that acts as an agent or broker in any aspect of the innovation process between two or more parties.

Innovation intermediaries[92] can perform far broader roles and operate in much wider networks than the classical 'extension agent' who was seen to provide 'knowledge transfer' and/or 'individual decision-support – functions. In the context of the ambition to effectively embed research, a key intermediary task (that may be performed by researchers or process facilitators) is the eliciting of relevant questions for research including those that are hidden in the interaction among stakeholders (farmers and traders) and the uncertainties and doubts that they experience in relations to social and technical options.

### 6.6.3 Towards appropriate curricula

Farmers[93] are also aware that universities and colleges are still teaching out-dated agronomic practices. Agricultural curricula still emphasise training which is supply-driven as opposed to learning which is more demand-driven. Farmers and traders sometimes learn on their own and sometimes they do it with their peers. They use multiple ways such as attending field days, networking, experimenting and agriculture shows. This learning is directed by peers, individually and collaboratively. Through this learning, they increase performance (more yield, more commodities for sale, better use of water, better ways of storing tomatoes and potatoes in response to the market). At the moment no one is documenting and producing relevant new books and manuals based on evidence on the ground and in informal markets. Extension messages have to be change in order to influence academia from where extension officers get their knowledge. Agriculture knowledge should be a blend of what happens in farming areas, in the soil and on the market. Many farmers who have mastered everything

[92] There is an increasing role for intermediaries as revealed by FISHER, C. & VOGEL, I. 2008. *Locating the power of the in-between: How research brokers and intermediaries support evidence based pro-poor policy and practice.* Institute of Development Studies – University of Sussex, Sussex.

[93] Farmer respondent 17 shares how he has better access to information than government extension officers who also rely on him and other farmers for latest insights from the market.

about production find themselves partially knowledgeable when they do not have a grasp of the market. While private companies promoting hybrids have formal ways of certifying seed in line with academic agricultural knowledge, seed and other planting materials that are in the hands of farmers and traders do not have certification schemes. However, such seed continues to be produced and related products sold in the market where they feed the majority of consumers.

The informal market has shown that learning has to be intertwined with judgment and exploration. Through the market, farmers and traders acknowledge the importance of learning from failure as from success. The informal market has a range of possibilities that creative thinking can generate and provide a springboard from which to transform learning in the agriculture sector and beyond. Agriculture colleges and universities should now craft courses that embrace multidisciplinary approaches that incorporate technology to create a better learning environment for farmers, traders and extension officers. Agriculture courses and extension models should help farmers and agriculture graduates develop better intuition about physical phenomena like farmers' fields and informal markets. The focus should be on active learning approaches (highly collaborative and hands-on environment as opposed to lectures and recitation of formulas.

Informal markets are based on free-wheeling creativity among farmers and traders. Policymakers should not try to kill these COPs through wholesale formalisation. They should find ways of triggering more vibrant COPs and keep them vibrant. Given the amount of resources that have already been invested in the direction of formal learning, this sort of learning will continue for a long time. However, recognizing the existence of informal learning means Zimbabwe's agriculture sector requires two strands:

1. A working environment where work gets done according to plans and logical frameworks by government departments and NGOs on one side and;
2. Informal learning in informal agriculture markets where free-wheeling creativity is allowed and even nurtured towards keeping the agricultural sector more relevant.

A different set of skills is required to see and promote the balance between formal and informal learning. Such skills cannot come from the formal education system alone. The informal market should be kept agile enough to stay relevant and that is why creativity is a huge asset in this market. Middlemen and auctioneers have to be recognised for tweaking things in a way that moves the creative process along. Policy makers and development

partners can make better decisions by actively listening to farmers and traders as networked contributors who are closely in touch with their environment. With an informed perspective, they can propose changes and build consensus around suggested responses.

In any informal agriculture market, farmers and traders are not waiting for science to come and make a difference. Change is already in the making and socio-economic experiments are already taking place even if they are not labelled as such. Diversity already exists and can be a highly relevant resource in enhancing adaptive capacity especially because some networks of farmers and traders are likely to have already discovered or created useful ways of addressing socio-economic challenges. Some farmers in Mutoko, Mutasa and Esigodini rural areas manage to have relatively moist soils in situations where others face drought. Some traders continue doing business in environments where formal agribusinesses get out of business. This existing diversity is a resource that is under-utilized by science and policy in enhancing people's adaptive capacity. Thus, science and research can usefully identify and study existing diversity within seemingly homogeneous categories and aim to understand what is special about cases that stand out positively. Underlying principles may be further tested, enriched and adapted into feasible social and technical options for others.

Although informal markets show the prevalence of complexity in the agriculture sector, researchers still have many incentives for doing narrow disciplinary research in 'easy' research settings. Even in an integrative field such as agronomy, students may prefer to study phenomena only in controlled settings such as laboratories, computer models and experimental research facilities. Similarly, scientists often study processes from a narrow disciplinary perspective (e.g. focusing only on individual or collective dimensions of human behaviour without looking at the linkages which happen in places like informal markets.

Informal markets show how learning is a social process. Learning occurs not as a response to teaching but rather as a result of a social framework that fosters learning. The informal market is such a framework. Policy makers and technology providers are realizing that to succeed in building technology and new media that supports learning among farmers, traders and other value chain actors, they have to move far beyond the traditional view of teaching as delivery of information. On the other hand, agriculture extension workers are realizing that although information is a critical part of learning, it is only one among many forces at work, particularly in the agriculture sector. It may be misleading and ineffective to separate information, theories, and principles from the activities and situations within which they are used. Knowledge is inextricably situated in the physical and social context of its acquisition

and use. As shown in the research, tomato and potato farmers use knowledge according to their context although the formal prescription on how seed should be planted is the same.

Contextual research in places like informal agriculture markets can lead to the identification of patterns across sites and help policy makers, researchers and development partners to generalize at the level of theory. Future research can also focus on the linkages between the formal and informal sectors and the challenges they encounter in the business environment. If informal ways of learning through agriculture markets are well-designed and well-facilitated they can help to identify activities that are likely to be most productive and effective in a particular formal or informal context. Over and above the scope to enable farmers and traders to identify what blend of formal and informal ideas makes sense, participation in informal agriculture markets leads to real ownership of the learning experience. This also ensures that the framing of challenges and solutions is appropriate to the informal agriculture market. Identifying and capitalising on the opportunities that exist in informal markets can open space for more meaningful and effective dialogue and also facilitate more inclusive engagement between formal and informal learning. Some of the lingering questions for further research include:

1. How can a process of dialogue between worldviews be promoted and supported?
2. How can the formal education system be reformed to recognise informal learning that happens and is proving to function in the informal economy?
3. How can Government, NGOs and development agencies who want to get a pie in the informal market participate in ways which enhance informal learning?

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